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**STATE OF CALIFORNIA**  
**DEPARTMENT OF TRANSPORTATION**

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# **NOTICE TO CONTRACTORS** **AND** **SPECIAL PROVISIONS**

**FOR CONSTRUCTION ON STATE HIGHWAY IN**  
**LAKE COUNTY NEAR MIDDLETOWN FROM 0.5 km SOUTH TO 0.2 km NORTH OF PUTAH CREEK BRIDGE**

**DISTRICT 01, ROUTE 29**

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**For Use in Connection with Standard Specifications Dated JULY 1999, Standard Plans**  
**Dated JULY 1999, and Labor Surcharge and Equipment Rental Rates.**

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**CONTRACT NO. 01-230014**  
**01-Lak-29-15.2/15.9**

**Federal Aid Project**  
**ACSTP-P029(085)E**

**Bids Open: September 20, 2000**  
**Dated: August 14, 2000**

**OSD**

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# IMPORTANT SPECIAL NOTICES

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- Attention is directed to the Notice to Contractor and Section 1, "Plans and Specifications," of the special provisions regarding references to the District and District Director's Office. The Office of the District Director for the Northern Region is located at Marysville.
- The Special Provisions for Federal-aid projects (with and without DBE goals) have been revised to incorporate changes made by new regulations governing the DBE Program (49 CFR Part 26).

Sections 2 and 5 incorporate the changes. Bidders should read these sections to become familiar with them. Attention is directed to the following significant changes:

Section 2, "Disadvantaged Business Enterprise (DBE)" revises the counting of participation by DBE primes, and the counting of trucking performed by DBE firms. The section also revises the information that must be submitted to the Department in order to receive credit for trucking.

Section 2, "Submission of DBE Information" revises the information required to be submitted to the Department to receive credit toward the DBE goal. It also revises the criteria to demonstrate good faith efforts.

Section 5, "Subcontractor and DBE Records" revises the information required to be reported at the end of the project, and information related to trucking that must be submitted throughout the project.

Section 5, "DBE Certification Status" adds new reporting requirements related to DBE certification.

Section 5, "Subcontracting" describes the efforts that must be made in the event a DBE subcontractor is terminated or fails to complete its work for any reason.

Section 5, "Prompt Progress Payment to Subcontractors" requires prompt payment to all subcontractors.

Section 5, "Prompt Payment of Withheld Funds to Subcontractors" requires the prompt payment of retention to all subcontractors.

- **SURETY 2000**

Caltrans is conducting a pilot program in cooperation with Surety 2000, to test electronic bond verification systems. The purpose of the pilot program is to test the use of Surety 2000 for verifying a bidder's bond electronically.

Surety 2000 is an Internet-based surety verification and security system, developed in conjunction with the surety industry. Surety agents may contact Surety 2000 at 1-800-660-3263.

Bidders are encouraged to participate in the pilot program. To participate, the bidder is asked to provide the "Authorization Code" provided by Surety 2000, on a separate sheet, together with the standard bidder's bond required by the specifications. The bidder's surety agent may obtain the "Authorization Code" from Surety 2000.

The Department will use the "Authorization Code" to access the Surety 2000 database, and independently verify the actual bidder's bond and document the functioning of the Surety 2000 system.

"Authorization Codes" will be used only to verify bidder's bonds, and only as part of the pilot program. The use of "Authorization Codes" will not be accepted in lieu of the bidder's bond or other bidder's security required in the specifications during the pilot study.

The function of the Surety 2000 system is to provide an easier way for Contractors to protect their bid security, and to discourage fraud. This system is available to all California admitted sureties and surety agents.

The results of the pilot study will be tabulated, and at some time in the future, the Department may consider accepting electronic bidder's bond verification in lieu of the bidder's bond specified.

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# STANDARD PLANS LIST

The Standard Plan sheets applicable to this contract include, but are not limited to those indicated below. The Revised Standard Plans (RSP) and New Standard Plans (NSP) which apply to this contract are included as individual sheets of the project plans.

|       |   |
|-------|---|
| A10A  | Abbreviations   |
| A10B  | Symbols   |
| A20A  | Pavement Markers and Traffic Lines, Typical Details   |
| A20B  | Pavement Markers and Traffic Lines, Typical Details   |
| A20C  | Pavement Markers and Traffic Lines, Typical Details   |
| A20D  | Pavement Markers and Traffic Lines, Typical Details   |
| A24A  | Pavement Markings - Arrows  |
| A24B  | Pavement Markings - Arrows  |
| A24C  | Pavement Markings - Symbols and Numerals  |
| A24D  | Pavement Markings - Words   |
| A24E  | Pavement Markings - Words and Crosswalks  |
| A62A  | Excavation and Backfill - Miscellaneous Details   |
| A62C  | Limits of Payment for Excavation and Backfill - Bridge  |
| A73A  | Object Markers  |
| A73B  | Markers   |
| A73C  | Delineators, Channelizers and Barricades  |
| A77A  | Metal Beam Guard Railing – Typical Wood Post With Wood Block  |
| A77B  | Metal Beam Guard Railing - Standard Hardware  |
| A77C  | Metal Beam Guard Railing – Wood Post and Wood Block Details   |
| A77D  | Metal Beam Guard Railing – Typical Layouts  |
| A77E  | Metal Beam Guard Railing – Typical Layouts  |
| A77F  | Metal Beam Guard Railing – Typical Embankment Widening for End Treatments                               |
| A77FA | Metal Beam Guard Railing – Typical Line Post Installation   |
| A77G  | Metal Beam Guard Railing – End Treatment, Terminal Anchor Assembly (Type SFT)                           |
| A77H  | Metal Beam Guard Railing - Anchor Cable and Anchor Plate Details  |
| A77I  | Metal Beam Guard Railing – End Treatment, Terminal Anchor Assembly (Type CA)                            |
| A77IA | Metal Beam Guard Railing – End Treatment, Buried Post Anchor  |
| A77J  | Metal Beam Guard Railing Connections to Bridge Railings, Retaining Walls and Abutments                  |
| A77L  | Metal Beam Guard Railing and Single Faced Barrier Railing - End Treatment                               |
| A86   | Barbed Wire and Wire Mesh Fences  |
| A87   | Curbs, Dikes and Driveways  |
| D97A  | Corrugated Metal Pipe Coupling Details No. 1 - Annular Coupling Band Bar and Strap and Angle Connectors |
| D97B  | Corrugated Metal Pipe Coupling Details No. 2 - Hat Band Coupler and Flange Details                      |
| D97F  | Corrugated Metal Pipe Coupling Details No. 6 - Positive Joint   |
| T1A   | Temporary Crash Cushion, Sand Filled (Unidirectional)   |
| T1B   | Temporary Crash Cushion, Sand Filled (Bidirectional)  |
| T2    | Temporary Crash Cushion, Sand Filled (Shoulder Installations)   |
| T3    | Temporary Railing (Type K)  |
| T7    | Construction Project Funding Identification Signs   |
| T13   | Traffic Control System for Lane Closure On Two Lane Conventional Highways                               |
| T17   | Traffic Control System for Moving Lane Closure On Two Lane Highways                                     |
| B0-1  | Bridge Details  |
| B0-3  | Bridge Details  |
| B0-5  | Bridge Details  |
| B0-13 | Bridge Details  |

|        |   |
|--------|---|
| B6-10  | Utility Openings, T-Beam  |
| B6-21  | Joint Seals (Maximum Movement Rating = 50 mm)   |
| B7-1   | Box Girder Details  |
| B7-5   | Deck Drains   |
| B7-10  | Utility Opening - Box Girder  |
| B11-53 | Concrete Barrier Type 25  |
| B14-5  | Water Supply Line (Details) (Pipe Sizes Less Than NPS 4)                              |
| RS1    | Roadside Signs, Typical Installation Details No. 1                                    |
| RS2    | Roadside Signs - Wood Post, Typical Installation Details No. 2                        |
| ES-1A  | Signal, Lighting and Electrical Systems - Symbols and Abbreviations                   |
| ES-1B  | Signal, Lighting and Electrical Systems - Symbols and Abbreviations                   |
| ES-2A  | Signal, Lighting and Electrical Systems - Service Equipment                           |
| ES-3A  | Signal, Lighting and Electrical Systems - Controller Cabinet Details                  |
| ES-3B  | Signal, Lighting and Electrical Systems - Controller Cabinet Details                  |
| ES-3C  | Signal, Lighting and Electrical Systems - Controller Cabinet Details                  |
| ES-4A  | Signal, Lighting and Electrical Systems - Signal Heads and Mountings                  |
| ES-4C  | Signal, Lighting and Electrical Systems - Signal Heads and Mountings                  |
| ES-5A  | Signal, Lighting and Electrical Systems - Detectors                                   |
| ES-5B  | Signal, Lighting and Electrical Systems - Detectors                                   |
| ES-8   | Signal, Lighting and Electrical Systems - Pull Box Details                            |
| ES-9A  | Signal, Lighting and Electrical Systems - Electrical Details, Structure Installations |
| ES-9B  | Signal, Lighting and Electrical Systems - Electrical Details, Structure Installations |
| ES-9C  | Signal, Lighting and Electrical Systems - Electrical Details, Structure Installations |
| ES-9D  | Signal, Lighting and Electrical Systems - Electrical Details, Structure Installations |
| ES-10  | Signal, Lighting and Electrical Systems - Isolux Diagrams                             |
| ES-13A | Signal, Lighting and Electrical Systems - Splicing Details                            |
| ES-13B | Signal, Lighting and Electrical Systems - Wiring Details and Fuse Ratings             |

DEPARTMENT OF TRANSPORTATION

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NOTICE TO CONTRACTORS

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CONTRACT NO. 01-230014

01-Lak-29-15.2/15.9

Sealed proposals for the work shown on the plans entitled:

**STATE OF CALIFORNIA; DEPARTMENT OF TRANSPORTATION; PROJECT PLANS FOR CONSTRUCTION  
ON STATE HIGHWAY IN LAKE COUNTY NEAR MIDDLETOWN FROM 0.5 km SOUTH TO 0.2 km NORTH  
OF PUTAH CREEK BRIDGE**

will be received at the Department of Transportation, 1120 N Street, Room 0200, MS #26, Sacramento, CA 95814, until 2 o'clock p.m. on September 20, 2000, at which time they will be publicly opened and read in Room 0100 at the same address.

Proposal forms for this work are included in a separate book entitled:

**STATE OF CALIFORNIA; DEPARTMENT OF TRANSPORTATION; PROPOSAL AND CONTRACT FOR  
CONSTRUCTION ON STATE HIGHWAY IN LAKE COUNTY NEAR MIDDLETOWN FROM 0.5 km SOUTH TO  
0.2 km NORTH OF PUTAH CREEK BRIDGE**

General work description: Existing highway to be widened and surfaced with asphalt concrete, and replace existing bridge with cast-in-place reinforced concrete box girder structure.

This project has a goal of 9 percent disadvantaged business enterprise (DBE) participation.  
No prebid meeting is scheduled for this project.

**THIS PROJECT IS SUBJECT TO THE "BUY AMERICA" PROVISIONS OF THE SURFACE  
TRANSPORTATION ASSISTANCE ACT OF 1982 AS AMENDED BY THE INTERMODAL SURFACE  
TRANSPORTATION EFFICIENCY ACT OF 1991.**

Bids are required for the entire work described herein.

At the time this contract is awarded, the Contractor shall possess either a Class A license or a combination of any of the following Class C licenses which constitutes a majority of the work: C-8, C-12.

This contract is subject to state contract nondiscrimination and compliance requirements pursuant to Government Code, Section 12990.

The District in which the work for this project is located has been incorporated into the Department's Northern Region. References in the Standard Specifications or in the special provisions to the district shall be deemed to mean the Northern Region. The office of the District Director for the Northern Region is located at Marysville.

Project plans, special provisions, and proposal forms for bidding this project can only be obtained at the Department of Transportation, Plans and Bid Documents, Room 0200, MS #26, Transportation Building, 1120 N Street, Sacramento, California 95814, FAX No. (916) 654-7028, Telephone No. (916) 654-4490. Use FAX orders to expedite orders for project plans, special provisions and proposal forms. FAX orders must include credit card charge number, card expiration date and authorizing signature. Project plans, special provisions, and proposal forms may be seen at the above Department of Transportation office and at the offices of the District Directors of Transportation at Irvine, Oakland, and the district in which the work is situated. Standard Specifications are available through the State of California, Department of Transportation, Publications Unit, 1900 Royal Oaks Drive, Sacramento, CA 95815, Telephone No. (916) 445-3520.

Cross sections for this project are available at the office of the District Director of Transportation of the district in which the work is situated in paper copy format.

The successful bidder shall furnish a payment bond and a performance bond.

The Department of Transportation hereby notifies all bidders that it will affirmatively insure that in any contract entered into pursuant to this advertisement, disadvantaged business enterprises will be afforded full opportunity to submit bids in response to this invitation.

The U.S. Department of Transportation (DOT) provides a toll-free "hotline" service to report bid rigging activities. Bid rigging activities can be reported Mondays through Fridays, between 8:00 a.m. and 5:00 p.m., eastern time, Telephone No. 1-800-424-9071. Anyone with knowledge of possible bid rigging, bidder collusion, or other fraudulent activities should use the "hotline" to report these activities. The "hotline" is part of the DOT's continuing effort to identify and investigate highway construction contract fraud and abuse and is operated under the direction of the DOT Inspector General. All information will be treated confidentially and caller anonymity will be respected.

Pursuant to Section 1773 of the Labor Code, the general prevailing wage rates in the county, or counties, in which the work is to be done have been determined by the Director of the California Department of Industrial Relations. These wages are set forth in the General Prevailing Wage Rates for this project, available at the Labor Compliance Office at the offices of the District Director of Transportation for the district in which the work is situated, and available from the California Department of Industrial Relations' Internet Web Site at: <http://www.dir.ca.gov>. The Federal minimum wage rates for this project as predetermined by the United States Secretary of Labor are set forth in the books issued for bidding purposes entitled "Proposal and Contract," and in copies of this book that may be examined at the offices described above where project plans, special provisions, and proposal forms may be seen. Addenda to modify the Federal minimum wage rates, if necessary, will be issued to holders of "Proposal and Contract" books. Future effective general prevailing wage rates which have been predetermined and are on file with the California Department of Industrial Relations are referenced but not printed in the general prevailing wage rates.

Attention is directed to the Federal minimum wage rate requirements in the books entitled "Proposal and Contract." If there is a difference between the minimum wage rates predetermined by the Secretary of Labor and the general prevailing wage rates determined by the Director of the California Department of Industrial Relations for similar classifications of labor, the Contractor and subcontractors shall pay not less than the higher wage rate. The Department will not accept lower State wage rates not specifically included in the Federal minimum wage determinations. This includes "helper" (or other classifications based on hours of experience) or any other classification not appearing in the Federal wage determinations. Where Federal wage determinations do not contain the State wage rate determination otherwise available for use by the Contractor and subcontractors, the Contractor and subcontractors shall pay not less than the Federal minimum wage rate which most closely approximates the duties of the employees in question.

DEPARTMENT OF TRANSPORTATION

Deputy Director Transportation Engineering

Dated August 14, 2000

PCF

**COPY OF ENGINEER'S ESTIMATE**  
**(NOT TO BE USED FOR BIDDING PURPOSES)**  
**01-230014**

| Item      | Item Code | Item   | Unit of Measure | Estimated Quantity |
|-----------|-----------|--|-----------------|--------------------|
| 1         | 070010    | PROGRESS SCHEDULE (CRITICAL PATH)            | LS              | LUMP SUM           |
| 2         | 070018    | TIME-RELATED OVERHEAD                        | WDAY            | 430                |
| 3<br>(S)  | 120090    | CONSTRUCTION AREA SIGNS                      | LS              | LUMP SUM           |
| 4<br>(S)  | 120100    | TRAFFIC CONTROL SYSTEM                       | LS              | LUMP SUM           |
| 5         | 019510    | TEMPORARY CREEK DIVERSION SYSTEM             | LS              | LUMP SUM           |
| 6<br>(S)  | 120149    | TEMPORARY PAVEMENT MARKING (PAINT)           | M2              | 22                 |
| 7<br>(S)  | 120152    | TEMPORARY PAVEMENT MARKING (TAPE)            | M2              | 6                  |
| 8<br>(S)  | 120159    | TEMPORARY TRAFFIC STRIPE (PAINT)             | M               | 2820               |
| 9<br>(S)  | 120165    | CHANNELIZER (SURFACE MOUNTED)                | EA              | 140                |
| 10<br>(S) | 128601    | TEMPORARY SIGNAL SYSTEM                      | LS              | LUMP SUM           |
| 11<br>(S) | 128650    | PORTABLE CHANGEABLE MESSAGE SIGN             | EA              | 3                  |
| 12<br>(S) | 019511    | TEMPORARY SOLAR POWER FLASHING BEACON SYSTEM | LS              | LUMP SUM           |
| 13<br>(S) | 129000    | TEMPORARY RAILING (TYPE K)                   | M               | 420                |
| 14<br>(S) | 129100    | TEMPORARY CRASH CUSHION MODULE               | EA              | 22                 |
| 15        | 150605    | REMOVE FENCE                                 | M               | 280                |
| 16<br>(S) | 150662    | REMOVE METAL BEAM GUARD RAILING              | M               | 75                 |
| 17        | 150668    | REMOVE FLARED END SECTION                    | EA              | 1                  |
| 18        | 150742    | REMOVE ROADSIDE SIGN                         | EA              | 1                  |
| 19        | 152320    | RESET ROADSIDE SIGN                          | EA              | 9                  |
| 20        | 152390    | RELOCATE ROADSIDE SIGN                       | EA              | 3                  |

| Item      | Item Code | Item  | Unit of Measure | Estimated Quantity |
|-----------|-----------|---|-----------------|--------------------|
| 21<br>(S) | 153103    | COLD PLANE ASPHALT CONCRETE PAVEMENT        | M2              | 7640               |
| 22        | 157550    | BRIDGE REMOVAL                              | LS              | LUMP SUM           |
| 23        | 160101    | CLEARING AND GRUBBING                       | LS              | LUMP SUM           |
| 24        | 190101    | ROADWAY EXCAVATION                          | M3              | 3650               |
| 25<br>(F) | 192003    | STRUCTURE EXCAVATION (BRIDGE)               | M3              | 429                |
| 26<br>(F) | 193003    | STRUCTURE BACKFILL (BRIDGE)                 | M3              | 200                |
| 27        | 198001    | IMPORTED BORROW                             | M3              | 5260               |
| 28<br>(S) | 203003    | STRAW (EROSION CONTROL)                     | TONN            | 2.5                |
| 29<br>(S) | 203014    | FIBER (EROSION CONTROL)                     | KG              | 630                |
| 30<br>(S) | 203024    | COMPOST (EROSION CONTROL)                   | KG              | 1880               |
| 31<br>(S) | 203045    | PURE LIVE SEED (EROSION CONTROL)            | KG              | 43                 |
| 32<br>(S) | 203056    | COMMERCIAL FERTILIZER (EROSION CONTROL)     | KG              | 160                |
| 33<br>(S) | 203061    | STABILIZING EMULSION (EROSION CONTROL)      | KG              | 130                |
| 34        | 260201    | CLASS 2 AGGREGATE BASE                      | M3              | 1260               |
| 35        | 390102    | ASPHALT CONCRETE (TYPE A)                   | TONN            | 2080               |
| 36        | 390106    | ASPHALT CONCRETE (OPEN GRADED)              | TONN            | 500                |
| 37        | 394002    | PLACE ASPHALT CONCRETE (MISCELLANEOUS AREA) | M2              | 18                 |
| 38        | 394048    | PLACE ASPHALT CONCRETE DIKE (TYPE E)        | M               | 180                |
| 39        | 394049    | PLACE ASPHALT CONCRETE DIKE (TYPE F)        | M               | 23                 |
| 40        | 490566    | FURNISH STEEL PILING (HP 360 X 132)         | M               | 685                |

| Item        | Item Code | Item  | Unit of Measure | Estimated Quantity |
|-------------|-----------|---|-----------------|--------------------|
| 41<br>(S)   | 490567    | DRIVE STEEL PILE (HP 360 X 132)                       | EA              | 48                 |
| 42          | 490584    | FURNISH STEEL PIPE PILING (610 MM)                    | M               | 105                |
| 43<br>(S)   | 490585    | DRIVE STEEL PIPE PILE (610 MM)                        | EA              | 4                  |
| 44          | 499054    | FURNISH CAST-IN-STEEL-SHELL CONCRETE PILING (1524 MM) | M               | 335                |
| 45<br>(S)   | 499055    | DRIVE CAST-IN-STEEL-SHELL CONCRETE PILE (1524 MM)     | EA              | 9                  |
| 46          | 510051    | STRUCTURAL CONCRETE, BRIDGE FOOTING                   | M3              | 87                 |
| 47<br>(F)   | 510053    | STRUCTURAL CONCRETE, BRIDGE                           | M3              | 1220               |
| 48<br>(F)   | 510086    | STRUCTURAL CONCRETE, APPROACH SLAB (TYPE N)           | M3              | 99                 |
| 49<br>(S)   | 519144    | JOINT SEAL (MR 50 MM)                                 | M               | 38                 |
| 50<br>(S-F) | 520102    | BAR REINFORCING STEEL (BRIDGE)                        | KG              | 360 274            |
| 51          | 664016    | 450 MM CORRUGATED STEEL PIPE (2.77 MM THICK)          | M               | 5                  |
| 52          | 705044    | 450 MM STEEL FLARED END SECTION                       | EA              | 1                  |
| 53          | 720120    | ROCK SLOPE PROTECTION (1/2T, METHOD A)                | M3              | 4020               |
| 54          | 721010    | ROCK SLOPE PROTECTION (BACKING NO. 1, METHOD B)       | M3              | 1210               |
| 55          | 729010    | ROCK SLOPE PROTECTION FABRIC                          | M2              | 2940               |
| 56<br>(S-F) | 750501    | MISCELLANEOUS METAL (BRIDGE)                          | KG              | 2337               |
| 57          | 800052    | FENCE (TYPE WM, WOOD POST)                            | M               | 280                |
| 58          | 820108    | DELINEATOR (CLASS 2)                                  | EA              | 14                 |
| 59          | 820112    | MARKER (CULVERT)                                      | EA              | 2                  |
| 60          | 820151    | OBJECT MARKER (TYPE L-1)                              | EA              | 4                  |

| Item      | Item Code | Item   | Unit of Measure | Estimated Quantity |
|-----------|-----------|--|-----------------|--------------------|
| 61<br>(S) | 832003    | METAL BEAM GUARD RAILING (WOOD POST)                             | M               | 31                 |
| 62<br>(F) | 833125    | CONCRETE BARRIER (TYPE 25)                                       | M               | 270                |
| 63<br>(S) | 839551    | TERMINAL SECTION (TYPE B)  | EA              | 2                  |
| 64<br>(S) | 839553    | END SECTION  | EA              | 2                  |
| 65<br>(S) | 839565    | TERMINAL SYSTEM (TYPE SRT)                                       | EA              | 4                  |
| 66<br>(S) | 840515    | THERMOPLASTIC PAVEMENT MARKING                                   | M2              | 81                 |
| 67<br>(S) | 840561    | 100 MM THERMOPLASTIC TRAFFIC STRIPE                              | M               | 3840               |
| 68<br>(S) | 840563    | 200 MM THERMOPLASTIC TRAFFIC STRIPE                              | M               | 310                |
| 69<br>(S) | 840568    | 100 MM THERMOPLASTIC TRAFFIC STRIPE<br>(BROKEN 3.66 M - 0.92 M)  | M               | 260                |
| 70<br>(S) | 840570    | 100 MM THERMOPLASTIC TRAFFIC STRIPE<br>(BROKEN 10.98 M - 3.66 M) | M               | 15                 |
| 71<br>(S) | 850122    | PAVEMENT MARKER (RETROREFLECTIVE-<br>RECESSED)                   | EA              | 180                |
| 72        | 999990    | MOBILIZATION   | LS              | LUMP SUM           |



**STATE OF CALIFORNIA**  
**DEPARTMENT OF TRANSPORTATION**

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**SPECIAL PROVISIONS**

**Annexed to Contract No. 01-230014**

**SECTION 1. SPECIFICATIONS AND PLANS**

The work embraced herein shall conform to the provisions in the Standard Specifications dated July 1999, and the Standard Plans dated July 1999, of the Department of Transportation insofar as the same may apply, and these special provisions.

Amendments to the Standard Specifications set forth in these special provisions shall be considered as part of the Standard Specifications for the purposes set forth in Section 5-1.04, "Coordination and Interpretation of Plans, Standard Specifications and Special Provisions," of the Standard Specifications. Whenever either the term "Standard Specifications is amended" or the term "Standard Specifications are amended" is used in the special provisions, the indented text or table following the term shall be considered an amendment to the Standard Specifications. In case of conflict between such amendments and the Standard Specifications, the amendments shall take precedence over and be used in lieu of the conflicting portions.

The District in which the work for this project is located has been incorporated into the Department's Northern Region. References in the Standard Specifications or in these special provisions to the district shall be deemed to mean the Northern Region. The office of the District Director for the Northern Region is located at Marysville.

In case of conflict between the Standard Specifications and these special provisions, the special provisions shall take precedence over and shall be used in lieu of the conflicting portions.

**SECTION 2. PROPOSAL REQUIREMENTS AND CONDITIONS**

**2-1.01 GENERAL**

The bidder's attention is directed to the provisions in Section 2, "Proposal Requirements and Conditions," of the Standard Specifications and these special provisions for the requirements and conditions which the bidder must observe in the preparation of the Proposal form and the submission of the bid.

In addition to the subcontractors required to be listed in conformance with Section 2-1.054, "Required Listing of Proposed Subcontractors," of the Standard Specifications, each proposal shall have listed therein the portion of work that will be performed by each subcontractor listed.

The Bidder's Bond form mentioned in the last paragraph in Section 2-1.07, "Proposal Guaranty," of the Standard Specifications will be found following the signature page of the Proposal.

Submit request for substitution of an "or equal" item, and the data substantiating the request to the Department of Transportation, P.O. Box 911, Marysville, CA 95901, Attn: NRCO/Contract Administration Engineer, so that the request is received by the Department by close of business on the fourth day, not including Saturdays, Sundays and legal holidays, following bid opening.

In conformance with Public Contract Code Section 7106, a Noncollusion Affidavit is included in the Proposal. Signing the Proposal shall also constitute signature of the Noncollusion Affidavit.

The contractor, sub recipient or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the recipient deems appropriate. Each subcontract signed by the bidder must include this assurance.

**2-1.015 FEDERAL LOBBYING RESTRICTIONS**

Section 1352, Title 31, United States Code prohibits Federal funds from being expended by the recipient or any lower tier subrecipient of a Federal-aid contract to pay for any person for influencing or attempting to influence a Federal agency or Congress in connection with the awarding of any Federal-aid contract, the making of any Federal grant or loan, or the entering into of any cooperative agreement.

If any funds other than Federal funds have been paid for the same purposes in connection with this Federal-aid contract, the recipient shall submit an executed certification and, if required, submit a completed disclosure form as part of the bid documents.

A certification for Federal-aid contracts regarding payment of funds to lobby Congress or a Federal agency is included in the Proposal. Standard Form - LLL, "Disclosure of Lobbying Activities," with instructions for completion of the Standard Form is also included in the Proposal. Signing the Proposal shall constitute signature of the Certification.

The above-referenced certification and disclosure of lobbying activities shall be included in each subcontract and any lower-tier contracts exceeding \$100,000. All disclosure forms, but not certifications, shall be forwarded from tier to tier until received by the Engineer.

The Contractor, subcontractors and any lower-tier contractors shall file a disclosure form at the end of each calendar quarter in which there occurs any event that requires disclosure or that materially affects the accuracy of the information contained in any disclosure form previously filed by the Contractor, subcontractors and any lower-tier contractors. An event that materially affects the accuracy of the information reported includes:

- A. A cumulative increase of \$25,000 or more in the amount paid or expected to be paid for influencing or attempting to influence a covered Federal action; or
- B. A change in the person(s) or individual(s) influencing or attempting to influence a covered Federal action; or,
- C. A change in the officer(s), employee(s), or Member(s) contacted to influence or attempt to influence a covered Federal action.

#### **2-1.02 DISADVANTAGED BUSINESS ENTERPRISE (DBE)**

This project is subject to Part 26, Title 49, Code of Federal Regulations entitled "Participation by Disadvantaged Business Enterprises in Department of Transportation Financial Assistance Programs." The Regulations in their entirety are incorporated herein by this reference.

Bidders shall be fully informed respecting the requirements of the Regulations and the Department's Disadvantaged Business Enterprise (DBE) program developed pursuant to the Regulations; particular attention is directed to the following matters:

- A. A DBE must be a small business concern as defined pursuant to Section 3 of U.S. Small Business Act and relevant regulations promulgated pursuant thereto.
- B. A DBE may participate as a prime contractor, subcontractor, joint venture partner with a prime or subcontractor, vendor of material or supplies, or as a trucking company.
- C. A DBE bidder, not bidding as a joint venture with a non-DBE, will be required to document one or a combination of the following:
  - 1. The bidder will meet the goal by performing work with its own forces.
  - 2. The bidder will meet the goal through work performed by DBE subcontractors, suppliers or trucking companies.
  - 3. The bidder, prior to bidding, made adequate good faith efforts to meet the goal.
- D. A DBE joint venture partner must be responsible for specific contract items of work, or portions thereof. Responsibility means actually performing, managing and supervising the work with its own forces. The DBE joint venture partner must share in the capital contribution, control, management, risks and profits of the joint venture. The DBE joint venturer must submit the joint venture agreement with the proposal or the DBE Information form required in the Section entitled "Submission of DBE Information" of these special provisions.
- E. A DBE must perform a commercially useful function, i.e., must be responsible for the execution of a distinct element of the work and must carry out its responsibility by actually performing, managing and supervising the work.
- F. DBEs must be certified by either the California Department of Transportation, or by a participating State of California or local agency which certifies in conformance with Title 49, Code of Federal Regulations, Part 26, as of the date of bid opening. It is the Contractor's responsibility to verify that DBEs are certified. Listings of DBEs certified by the Department are available from the following sources:
  - 1. The Department's DBE Directory, which is published quarterly. This Directory may be obtained from the Department of Transportation, Materiel Operations Branch, Publication Distribution Unit, 1900 Royal Oaks Drive, Sacramento, California 95815, Telephone: (916) 445-3520.

2. The Department's Electronic Information Bulletin Board Service, which is accessible by modem and is updated weekly. The Bulletin Board may be accessed by first contacting the Department's Business Enterprise Program at Telephone: (916) 227-8937 and obtaining a user identification and password.
3. The Department's web site at <http://www.dot.ca.gov/hq/bep/index.htm>.
4. The organizations listed in the Section entitled "DBE Goal for this Project" of these special provisions.

G. Credit for materials or supplies purchased from DBEs will be as follows:

1. If the materials or supplies are obtained from a DBE manufacturer, 100 percent of the cost of the materials or supplies will count toward the DBE goal. A DBE manufacturer is a firm that operates or maintains a factory or establishment that produces, on the premises, the materials, supplies, articles, or equipment required under the contract and of the general character described by the specifications.
2. If the materials or supplies are purchased from a DBE regular dealer, 60 percent of the cost of the materials or supplies will count toward the DBE goal. A DBE regular dealer is a firm that owns, operates, or maintains a store, warehouse, or other establishment in which the materials, supplies, articles or equipment of the general character described by the specifications and required under the contract are bought, kept in stock, and regularly sold or leased to the public in the usual course of business. To be a DBE regular dealer, the firm must be an established, regular business that engages, as its principal business and under its own name, in the purchase and sale or lease of the products in question. A person may be a DBE regular dealer in such bulk items as petroleum products, steel, cement, gravel, stone, or asphalt without owning, operating, or maintaining a place of business as provided in this paragraph G.2. if the person both owns and operates distribution equipment for the products. Any supplementing of regular dealers' own distribution equipment shall be by a long-term lease agreement and not on an ad hoc or contract-by-contract basis. Packagers, brokers, manufacturers' representatives, or other persons who arrange or expedite transactions are not DBE regular dealers within the meaning of this paragraph G.2.
3. Credit for materials or supplies purchased from a DBE which is neither a manufacturer nor a regular dealer will be limited to the entire amount of fees or commissions charged for assistance in the procurement of the materials and supplies, or fees or transportation charges for the delivery of materials or supplies required on a job site, provided the fees are reasonable and not excessive as compared with fees charged for similar services.

H. Credit for DBE trucking companies will be as follows:

1. The DBE must be responsible for the management and supervision of the entire trucking operation for which it is responsible on a particular contract, and there cannot be a contrived arrangement for the purpose of meeting the DBE goal.
2. The DBE must itself own and operate at least one fully licensed, insured, and operational truck used on the contract.
3. The DBE receives credit for the total value of the transportation services it provides on the contract using trucks it owns, insures, and operates using drivers it employs.
4. The DBE may lease trucks from another DBE firm, including an owner-operator who is certified as a DBE. The DBE who leases trucks from another DBE receives credit for the total value of the transportation services the lessee DBE provides on the contract.
5. The DBE may also lease trucks from a non-DBE firm, including an owner-operator. The DBE who leases trucks from a non-DBE is entitled to credit only for the fee or commission it receives as a result of the lease arrangement. The DBE does not receive credit for the total value of the transportation services provided by the lessee, since these services are not provided by a DBE.
6. For the purposes of this paragraph H, a lease must indicate that the DBE has exclusive use of and control over the truck. This does not preclude the leased truck from working for others during the term of the lease with the consent of the DBE, so long as the lease gives the DBE absolute priority for use of the leased truck. Leased trucks must display the name and identification number of the DBE.

- I. Noncompliance by the Contractor with the requirements of the regulations constitutes a breach of this contract and may result in termination of the contract or other appropriate remedy for a breach of this contract.
- J. Bidders are encouraged to use services offered by financial institutions owned and controlled by DBEs.

## 2-1.02A DBE GOAL FOR THIS PROJECT

The Department has established the following goal for Disadvantaged Business Enterprise (DBE) participation for this project:

Disadvantaged Business Enterprise (DBE): 9 percent

Bidders may use the services of the following firms to contact interested DBEs. These firms are available to assist DBEs in preparing bids for subcontracting or supplying materials.

The following firms may be contacted for projects in the following locations:

|   |  |
|---|--|
| Districts 04, 05 (except San Luis Obispo and Santa Barbara Counties),<br>06 (except Kern County) and 10:  | Districts 08, 11 and 12:   |
| Triaxial Management Services, Inc.<br>- Oakland<br><br>1545 Willow Street, 1st Floor<br>Oakland, CA 94607<br>Telephone - (510) 286-1313<br>FAX No. - (510) 286-6792 | Triaxial Management Services, Inc.<br>- San Diego<br>2725 Congress Street,<br>Suite 1-D<br>San Diego, CA 92110<br>Telephone - (619) 543-5109<br>FAX No. - (619) 543-5108 |
| Districts 07 and 08;<br>in San Luis Obispo and Santa Barbara Counties<br>in District 05; and in Kern County in District 06:   | Districts 01, 02, 03 and 09:   |
| Triaxial Management Services, Inc.<br>- Los Angeles<br>2594 Industry Way, Suite 101<br>Lynwood, CA 90262<br>Telephone - (310) 537-6677<br>FAX No. - (310) 637-0128  | Triaxial Management Services, Inc.<br>- Sacramento<br>930 Alhambra Blvd., #205<br>Sacramento, CA 95816<br>Telephone - (916) 553-4172<br>FAX No. - (916) 553-4173         |

## 2-1.02B SUBMISSION OF DBE INFORMATION

The required DBE information shall be submitted on the "CALTRANS BIDDER - DBE INFORMATION" form included in the Proposal. If the DBE information is not submitted with the bid, the DBE Information form shall be removed from the documents prior to submitting the bid.

It is the bidder's responsibility to make enough work available to DBEs and to select those portions of the work or material needs consistent with the available DBEs to meet the goal for DBE participation or to provide information to establish that, prior to bidding, the bidder made adequate good faith efforts to do so.

If DBE information is not submitted with the bid, the apparent successful bidder (low bidder), the second low bidder and the third low bidder shall submit DBE information to the Department of Transportation, 1120 N Street, Room 0200, MS #26, Sacramento, California 95814 so the information is received by the Department no later than 4:00 p.m. on the fourth day, not including Saturdays, Sundays and legal holidays, following bid opening. DBE information sent by U.S. Postal Service certified mail with return receipt and certificate of mailing and mailed on or before the third day, not including Saturdays, Sundays and legal holidays, following bid opening will be accepted even if it is received after the fourth day following bid opening. Failure to submit the required DBE information by the time specified will be grounds for finding the bid or proposal nonresponsive. Other bidders need not submit DBE information unless requested to do so by the Department.

The bidder's DBE information shall establish that good faith efforts to meet the DBE goal have been made. To establish good faith efforts, the bidder shall demonstrate that the goal will be met or that, prior to bidding, adequate good faith efforts to meet the goal were made.

Bidders are cautioned that even though their submittal indicates they will meet the stated DBE goal, their submittal should also include their adequate good faith efforts information along with their DBE goal information to protect their eligibility for award of the contract in the event the Department, in its review, finds that the goal has not been met.

The bidder's DBE information shall include the names, addresses and phone numbers of DBE firms that will participate, with a complete description of work or supplies to be provided by each, the dollar value of each DBE transaction, and a

written confirmation from the DBE that it is participating in the contract. A copy of the DBE's quote will serve as written confirmation that the DBE is participating in the contract. When 100 percent of a contract item of work is not to be performed or furnished by a DBE, a description of the exact portion of that work to be performed or furnished by that DBE shall be included in the DBE information, including the planned location of that work. The work that a DBE prime contractor has committed to performing with its own forces as well as the work that it has committed to be performed by DBE subcontractors, suppliers and trucking companies will count toward the goal.

The information necessary to establish the bidder's adequate good faith efforts to meet the DBE goal should include:

- A. The names and dates of each publication in which a request for DBE participation for this project was placed by the bidder.
- B. The names and dates of written notices sent to certified DBEs soliciting bids for this project and the dates and methods used for following up initial solicitations to determine with certainty whether the DBEs were interested.
- C. The items of work which the bidder made available to DBE firms, including, where appropriate, any breaking down of the contract work items (including those items normally performed by the bidder with its own forces) into economically feasible units to facilitate DBE participation. It is the bidder's responsibility to demonstrate that sufficient work to meet the DBE goal was made available to DBE firms.
- D. The names, addresses and phone numbers of rejected DBE firms, the firms selected for that work, and the reasons for the bidder's choice.
- E. Efforts made to assist interested DBEs in obtaining bonding, lines of credit or insurance, and any technical assistance or information related to the plans, specifications and requirements for the work which was provided to DBEs.
- F. Efforts made to assist interested DBEs in obtaining necessary equipment, supplies, materials, or related assistance or services, excluding supplies and equipment the DBE subcontractor purchases or leases from the prime contractor or its affiliate.
- G. The names of agencies contacted to provide assistance in contacting, recruiting and using DBE firms.
- H. Any additional data to support a demonstration of good faith efforts.

### **SECTION 3. AWARD AND EXECUTION OF CONTRACT**

The bidder's attention is directed to the provisions in Section 3, "Award and Execution of Contract," of the Standard Specifications and these special provisions for the requirements and conditions concerning award and execution of contract.

The award of the contract, if it be awarded, will be to the lowest responsible bidder whose proposal complies with all the requirements prescribed and who has met the goal for DBE participation or has demonstrated, to the satisfaction of the Department, adequate good faith efforts to do so. Meeting the goal for DBE participation or demonstrating, to the satisfaction of the Department, adequate good faith efforts to do so is a condition for being eligible for award of contract.

A "Payee Data Record" form will be included in the contract documents to be executed by the successful bidder. The purpose of the form is to facilitate the collection of taxpayer identification data. The form shall be completed and returned to the Department by the successful bidder with the executed contract and contract bonds. For the purposes of the form, payee shall be deemed to mean the successful bidder. The form is not to be completed for subcontractors or suppliers. Failure to complete and return the "Payee Data Record" form to the Department as provided herein will result in the retention of 31 percent of payments due the contractor and penalties of up to \$20,000. This retention of payments for failure to complete the "Payee Data Record" form is in addition to any other retention of payments due the Contractor.

### **SECTION 4. BEGINNING OF WORK, TIME OF COMPLETION AND LIQUIDATED DAMAGES**

Attention is directed to the provisions in Section 8-1.03, "Beginning of Work," in Section 8-1.06, "Time of Completion," and in Section 8-1.07, "Liquidated Damages," of the Standard Specifications and these special provisions.

The Contractor shall begin work within 15 calendar days after the contract has been approved by the Attorney General or the attorney appointed and authorized to represent the Department of Transportation.

This work shall be diligently prosecuted to completion before the expiration of **430 WORKING DAYS** beginning on the fifteenth calendar day after approval of the contract.

The Contractor shall pay to the State of California the sum of \$600 per day, for each and every calendar day's delay in finishing the work in excess of the number of working days prescribed above.

### **SECTION 5. GENERAL**

#### **SECTION 5-1. MISCELLANEOUS**

### **5-1.01 PLANS AND WORKING DRAWINGS**

When the specifications require working drawings to be submitted to the Division of Structure Design, the drawings shall be submitted to: Division of Structure Design, Documents Unit, Mail Station 9, 1801 30th Street, Sacramento, CA 95816, Telephone 916 227-8252.

### **5-1.015 LABORATORY**

When a reference is made in the specifications to the "Laboratory," the reference shall mean the Division of Materials Engineering and Testing Services and the Division of Structural Foundations of the Department of Transportation, or established laboratories of the various Districts of the Department, or other laboratories authorized by the Department to test materials and work involved in the contract. When a reference is made in the specifications to the "Transportation Laboratory," the reference shall mean the Division of Materials Engineering and Testing Services and the Division of Structural Foundations, located at 5900 Folsom Boulevard, Sacramento, CA 95819, Telephone (916) 227-7000.

### **5-1.02 LABOR NONDISCRIMINATION**

Attention is directed to the following Notice that is required by Chapter 5 of Division 4 of Title 2, California Code of Regulations.

#### **NOTICE OF REQUIREMENT FOR NONDISCRIMINATION PROGRAM (GOV. CODE, SECTION 12990)**

Your attention is called to the "Nondiscrimination Clause", set forth in Section 7-1.01A(4), "Labor Nondiscrimination," of the Standard Specifications, which is applicable to all nonexempt State contracts and subcontracts, and to the "Standard California Nondiscrimination Construction Contract Specifications" set forth therein. The specifications are applicable to all nonexempt State construction contracts and subcontracts of \$5000 or more.

### **5-1.03 INTEREST ON PAYMENTS**

Interest shall be payable on progress payments, payments after acceptance, final payments, extra work payments, and claim payments as follows:

- A. Unpaid progress payments, payment after acceptance, and final payments shall begin to accrue interest 30 days after the Engineer prepares the payment estimate.
- B. Unpaid extra work bills shall begin to accrue interest 30 days after preparation of the first pay estimate following receipt of a properly submitted and undisputed extra work bill. To be properly submitted, the bill must be submitted within 7 days of the performance of the extra work and in conformance with the provisions in Section 9-1.03C, "Records," and Section 9-1.06, "Partial Payments," of the Standard Specifications. An undisputed extra work bill not submitted within 7 days of performance of the extra work will begin to accrue interest 30 days after the preparation of the second pay estimate following submittal of the bill.
- C. The rate of interest payable for unpaid progress payments, payments after acceptance, final payments, and extra work payments shall be 10 percent per annum.
- D. The rate of interest payable on a claim, protest or dispute ultimately allowed under this contract shall be 6 percent per annum. Interest shall begin to accrue 61 days after the Contractor submits to the Engineer information in sufficient detail to enable the Engineer to ascertain the basis and amount of said claim, protest or dispute.

The rate of interest payable on any award in arbitration shall be 6 percent per annum if allowed under the provisions of Civil Code Section 3289.

### **5-1.04 PUBLIC SAFETY**

The Contractor shall provide for the safety of traffic and the public in conformance with the provisions in Section 7-1.09, "Public Safety," of the Standard Specifications and these special provisions.

The Contractor shall install temporary railing (Type K) between a lane open to public traffic and an excavation, obstacle or storage area when the following conditions exist:

- A. Excavations.—The near edge of the excavation is 3.6 m or less from the edge of the lane, except:
  1. Excavations covered with sheet steel or concrete covers of adequate thickness to prevent accidental entry by traffic or the public.
  2. Excavations less than 0.3-m deep.

3. Trenches less than 0.3-m wide for irrigation pipe or electrical conduit, or excavations less than 0.3-m in diameter.
  4. Excavations parallel to the lane for the purpose of pavement widening or reconstruction.
  5. Excavations in side slopes, where the slope is steeper than 1:4 (vertical:horizontal).
  6. Excavations protected by existing barrier or railing.
- B. Temporarily Unprotected Permanent Obstacles.—The work includes the installation of a fixed obstacle together with a protective system, such as a sign structure together with protective railing, and the Contractor elects to install the obstacle prior to installing the protective system; or the Contractor, for the Contractor's convenience and with permission of the Engineer, removes a portion of an existing protective railing at an obstacle and does not replace such railing complete in place during the same day.
- C. Storage Areas.—Material or equipment is stored within 3.6 m of the lane and the storage is not otherwise prohibited by the provisions of the Standard Specifications and these special provisions.

The approach end of temporary railing (Type K), installed in conformance with the provisions in this section "Public Safety" and in Section 7-1.09, "Public Safety," of the Standard Specifications, shall be offset a minimum of 4.6 m from the edge of the traffic lane open to public traffic. The temporary railing shall be installed on a skew toward the edge of the traffic lane of not more than 0.3-m transversely to 3 m longitudinally with respect to the edge of the traffic lane. If the 4.6-m minimum offset cannot be achieved, the temporary railing shall be installed on the 10 to 1 skew to obtain the maximum available offset between the approach end of the railing and the edge of the traffic lane, and an array of temporary crash cushion modules shall be installed at the approach end of the temporary railing.

Temporary railing (Type K) shall conform to the provisions in Section 12-3.08, "Temporary Railing (Type K)," of the Standard Specifications. Temporary railing (Type K), conforming to the details shown on 1999 Standard Plan T3, may be used. Temporary railing (Type K) fabricated prior to January 1, 1993, and conforming to 1988 Standard Plan B11-30 may be used, provided the fabrication date is printed on the required Certificate of Compliance.

Temporary crash cushion modules shall conform to the provisions in "Temporary Crash Cushion Module" of these special provisions.

Except for installing, maintaining and removing traffic control devices, whenever work is performed or equipment is operated in the following work areas, the Contractor shall close the adjacent traffic lane unless otherwise provided in the Standard Specifications and these special provisions:

| Approach Speed of Public Traffic (Posted Limit)<br>(Kilometers Per Hour) | Work Areas   |
|--|--|
| Over 72 (45 Miles Per Hour)  | Within 1.8 m of a traffic lane but not on a traffic lane |
| 56 to 72 (35 to 45 Miles Per Hour)                                       | Within 0.9-m of a traffic lane but not on a traffic lane |

The lane closure provisions of this section shall not apply if the work area is protected by permanent or temporary railing or barrier.

When traffic cones or delineators are used to delineate a temporary edge of a traffic lane, the line of cones or delineators shall be considered to be the edge of the traffic lane, however, the Contractor shall not reduce the width of an existing lane to less than 3 m without written approval from the Engineer.

When work is not in progress on a trench or other excavation that required closure of an adjacent lane, the traffic cones or portable delineators used for the lane closure shall be placed off of and adjacent to the edge of the traveled way. The spacing of the cones or delineators shall be not more than the spacing used for the lane closure.

Suspended loads or equipment shall not be moved nor positioned over public traffic or pedestrians.

Full compensation for conforming to the provisions in this section "Public Safety," including furnishing and installing temporary railing (Type K) and temporary crash cushion modules, shall be considered as included in the contract prices paid for the various items of work involved and no additional compensation will be allowed therefor.

#### **5-1.05 SURFACE MINING AND RECLAMATION ACT**

Attention is directed to the Surface Mining and Reclamation Act of 1975, commencing in Public Resources Code, Mining and Geology, Section 2710, which establishes regulations pertinent to surface mining operations.

Material from mining operations furnished for this project shall only come from permitted sites in compliance with the Surface Mining and Reclamation Act of 1975.

The requirements of this section shall apply to materials furnished for the project, except for acquisition of materials in conformance with the provisions in Section 4-1.05, "Use of Materials Found on the Work," of the Standard Specifications.

### **5-1.06 REMOVAL OF ASBESTOS AND HAZARDOUS SUBSTANCES**

When the presence of asbestos or hazardous substances are not shown on the plans or indicated in the specifications and the Contractor encounters materials which the Contractor reasonably believes to be asbestos or a hazardous substance as defined in Section 25914.1 of the Health and Safety Code, and the asbestos or hazardous substance has not been rendered harmless, the Contractor may continue work in unaffected areas reasonably believed to be safe. The Contractor shall immediately cease work in the affected area and report the condition to the Engineer in writing.

In conformance with Section 25914.1 of the Health and Safety Code, removal of asbestos or hazardous substances including exploratory work to identify and determine the extent of the asbestos or hazardous substance will be performed by separate contract.

If delay of work in the area delays the current controlling operation, the delay will be considered a right of way delay and the Contractor will be compensated for the delay in conformance with the provisions in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

### **5-1.07 YEAR 2000 COMPLIANCE**

This contract is subject to Year 2000 Compliance for automated devices in the State of California.

Year 2000 compliance for automated devices in the State of California is achieved when embedded functions have or create no logical or mathematical inconsistencies when dealing with dates prior to and beyond 1999. The year 2000 is recognized and processed as a leap year. The product shall operate accurately in the manner in which the product was intended for date operation without requiring manual intervention.

The Contractor shall provide the Engineer a Certificate of Compliance from the manufacturer in conformance with the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications for all automated devices furnished for the project.

### **5-1.075 BUY AMERICA REQUIREMENTS**

Attention is directed to the "Buy America" requirements of the Surface Transportation Assistance Act of 1982 (Section 165) and the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) Sections 1041(a) and 1048(a), and the regulations adopted pursuant thereto. In conformance with the law and regulations, all manufacturing processes for steel and iron materials furnished for incorporation into the work on this project shall occur in the United States; with the exception that pig iron and processed, pelletized and reduced iron ore manufactured outside of the United States may be used in the domestic manufacturing process for such steel and iron materials. The application of coatings, such as epoxy coating, galvanizing, painting, and other coatings that protect or enhance the value of steel or iron materials shall be considered a manufacturing process subject to the "Buy America" requirements.

A Certificate of Compliance conforming to the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications shall be furnished for steel and iron materials. The certificates, in addition to certifying that the materials comply with the specifications, shall specifically certify that all manufacturing processes for the materials occurred in the United States, except for the above exceptions.

The requirements imposed by the law and regulations do not prevent a minimal use of foreign steel and iron materials if the total combined cost of the materials used does not exceed one-tenth of one percent (0.1 percent) of the total contract cost or \$2500, whichever is greater. The Contractor shall furnish the Engineer acceptable documentation of the quantity and value of the foreign steel and iron prior to incorporating the materials into the work.

### **5-1.08 SUBCONTRACTOR AND DBE RECORDS**

The Contractor shall maintain records showing the name and business address of each first-tier subcontractor. The records shall also show the name and business address of every DBE subcontractor, DBE vendor of materials and DBE trucking company, regardless of tier. The records shall show the date of payment and the total dollar figure paid to all of these firms. DBE prime contractors shall also show the date of work performed by their own forces along with the corresponding dollar value of the work.

Upon completion of the contract, a summary of these records shall be prepared on Form CEM-2402 (F) and certified correct by the Contractor or the Contractor's authorized representative, and shall be furnished to the Engineer. The form shall be furnished to the Engineer within 90 days from the date of contract acceptance. \$10,000 will be withheld from payment until the Form CEM-2402 (F) is submitted. The amount will be returned to the Contractor when a satisfactory Form CEM-2402 (F) is submitted.

Prior to the fifteenth of each month, the Contractor shall submit documentation to the Engineer showing the amount paid to DBE trucking companies listed in the Contractor's DBE information. This monthly documentation shall indicate the portion of the revenue paid to DBE trucking companies which is claimed toward DBE participation. The Contractor shall also obtain and submit documentation to the Engineer showing the amount paid by DBE trucking companies to all firms, including owner-operators, for the leasing of trucks. The DBE who leases trucks from a non-DBE is entitled to credit only for the fee or commission it receives as a result of the lease arrangement. The records must confirm that the amount of credit



claimed toward DBE participation conforms with Section 2-1.02, "Disadvantaged Business Enterprise," of these special provisions.

The Contractor shall also obtain and submit documentation to the Engineer showing the truck number, owner's name, California Highway Patrol CA number, and if applicable, the DBE certification number of the owner of the truck for all trucks used during that month for which DBE participation will be claimed. This documentation shall be submitted on Form CEM-2404 (F).

#### **5-1.083 DBE CERTIFICATION STATUS**

If a DBE subcontractor is decertified during the life of the project, the decertified subcontractor shall notify the Contractor in writing with the date of decertification. If a subcontractor becomes a certified DBE during the life of the project, the subcontractor shall notify the Contractor in writing with the date of certification. The Contractor shall furnish the written documentation to the Engineer.

Upon completion of the contract, Form CEM-2403 (F) indicating the DBE's existing certification status shall be signed and certified correct by the Contractor. The certified form shall be furnished to the Engineer within 90 days from the date of contract acceptance.

#### **5-1.086 PERFORMANCE OF DBE SUBCONTRACTORS AND SUPPLIERS**

The DBEs listed by the Contractor in response to the provisions in Section 2-1.02B, "Submission of DBE Information," and Section 3, "Award and Execution of Contract," of these special provisions, which are determined by the Department to be certified DBEs, shall perform the work and supply the materials for which they are listed, unless the Contractor has received prior written authorization to perform the work with other forces or to obtain the materials from other sources.

Authorization to use other forces or sources of materials may be requested for the following reasons:

- A. The listed DBE, after having had a reasonable opportunity to do so, fails or refuses to execute a written contract, when such written contract, based upon the general terms, conditions, plans and specifications for the project, or on the terms of such subcontractor's or supplier's written bid, is presented by the Contractor.
- B. The listed DBE becomes bankrupt or insolvent.
- C. The listed DBE fails or refuses to perform the subcontract or furnish the listed materials.
- D. The Contractor stipulated that a bond was a condition of executing a subcontract and the listed DBE subcontractor fails or refuses to meet the bond requirements of the Contractor.
- E. The work performed by the listed subcontractor is substantially unsatisfactory and is not in substantial conformance with the plans and specifications, or the subcontractor is substantially delaying or disrupting the progress of the work.
- F. It would be in the best interest of the State.

The Contractor shall not be entitled to any payment for such work or material unless it is performed or supplied by the listed DBE or by other forces (including those of the Contractor) pursuant to prior written authorization of the Engineer.

#### **5-1.09 SUBCONTRACTING**

Attention is directed to the provisions in Section 8-1.01, "Subcontracting," of the Standard Specifications, and Section 2, "Proposal Requirements and Conditions," and Section 3, "Award and Execution of Contract," of these special provisions.

Pursuant to the provisions of Section 1777.1 of the Labor Code, the Labor Commissioner publishes and distributes a list of contractors ineligible to perform work as a subcontractor on a public works project. This list of debarred contractors is available from the Department of Industrial Relations web site at:

<http://www.dir.ca.gov/DLSE/Debar.html>.

The provisions in the third paragraph of Section 8-1.01, "Subcontracting," of the Standard Specifications, that the Contractor shall perform with the Contractor's own organization contract work amounting to not less than 50 percent of the original contract price, is not changed by the Federal Aid requirement specified under "Required Contract Provisions Federal-Aid Construction Contracts" in Section 14 of these special provisions that the Contractor perform not less than 30 percent of the original contract work with the Contractor's own organization.

Each subcontract and any lower tier subcontract that may in turn be made shall include the "Required Contract Provisions Federal-Aid Construction Contracts" in Section 14 of these special provisions. This requirement shall be enforced as follows:

- A. Noncompliance shall be corrected. Payment for subcontracted work involved will be withheld from progress payments due, or to become due, until correction is made. Failure to comply may result in termination of the contract.

In conformance with the Federal DBE regulations Sections 26.53(f)(1) and 26.53(f)(2) Part 26, Title 49 CFR:

- A. The Contractor shall not terminate for convenience a DBE subcontractor listed in response to Section 2-1.02B, "Submission of DBE Information," and then perform that work with its own forces, or those of an affiliate without the written consent of the Department, and
- B. If a DBE subcontractor is terminated or fails to complete its work for any reason, the Contractor will be required to make good faith efforts to substitute another DBE subcontractor for the original DBE subcontractor, to the extent needed to meet the contract goal.

The requirement in Section 2-1.02, "Disadvantaged Business Enterprise (DBE)," of these special provisions that DBEs must be certified on the date bids are opened does not apply to DBE substitutions after award of the contract.

#### **5-1.10 PROMPT PROGRESS PAYMENT TO SUBCONTRACTORS**

Attention is directed to the provisions in Sections 10262 and 10262.5 of the Public Contract Code and Section 7108.5 of the Business and Professions Code concerning prompt payment to subcontractors.

#### **5-1.102 PROMPT PAYMENT OF WITHHELD FUNDS TO SUBCONTRACTORS**

The Contractor shall return all moneys withheld in retention from the subcontractor within 30 days after receiving payment for work satisfactorily completed, even if the other contract work is not completed and has not been accepted in conformance with Section 7-1.17, "Acceptance of Contract," of the Standard Specifications. This requirement shall not be construed to limit or impair any contractual, administrative, or judicial remedies otherwise available to the Contractor or subcontractor in the event of a dispute involving late payment or nonpayment by the Contractor or deficient subcontract performance or noncompliance by a subcontractor.

#### **5-1.11 PARTNERING**

The State will promote the formation of a "Partnering" relationship with the Contractor in order to effectively complete the contract to the benefit of both parties. The purpose of this relationship will be to maintain cooperative communication and mutually resolve conflicts at the lowest possible management level.

The Contractor may request the formation of such a "Partnering" relationship by submitting a request in writing to the Engineer after approval of the contract. If the Contractor's request for "Partnering" is approved by the Engineer, scheduling of a "Partnering" workshop, selecting the "Partnering" facilitator and workshop site, and other administrative details shall be as agreed to by both parties.

The costs involved in providing a facilitator and a workshop site will be borne equally by the State and the Contractor. The Contractor shall pay all compensation for the wages and expenses of the facilitator and of the expenses for obtaining the workshop site. The State's share of such costs will be reimbursed to the Contractor in a change order written by the Engineer. Markups will not be added. All other costs associated with the "Partnering" relationship will be borne separately by the party incurring the costs.

The establishment of a "Partnering" relationship will not change or modify the terms and conditions of the contract and will not relieve either party of the legal requirements of the contract.

#### **5-1.12 FORCE ACCOUNT PAYMENT**

The second, third and fourth paragraphs of Section 9-1.03A, "Work Performed by Contractor," in the Standard Specifications, shall not apply.

Attention is directed to "Overhead" of these special provisions.

To the total of the direct costs for work performed on a force account basis, computed as provided in Sections 9-1.03A(1), "Labor," 9-1.03A(2), "Materials," and 9-1.03A(3), "Equipment Rental," of the Standard Specifications, there will be added the following markups:

| Cost             | Percent Markup |
|------------------|----------------|
| Labor            | 28             |
| Materials        | 10             |
| Equipment Rental | 10             |

The above markups shall be applied to all work performed on a force account basis, regardless of whether the work revises the current contract completion date.

The above markups, together with payments made for time-related overhead pursuant to "Overhead" of these special provisions, shall constitute full compensation for all overhead costs for work performed on a force account basis. These overhead costs shall be deemed to include all items of expense not specifically designated as cost or equipment rental in conformance with the provisions in Sections 9-1.03A(1), "Labor," 9-1.03A(2), "Materials," and 9-1.03A(3), "Equipment Rental," of the Standard Specifications. The total payment made as provided above and in the first paragraph of Section 9-1.03A, "Work Performed by Contractor," of the Standard Specifications shall be deemed to be the actual cost of the work performed on a force account basis, and shall constitute full compensation therefor. Full compensation for all overhead costs for work performed on a force account basis, and for which no adjustment is made to the quantity of time-related overhead pursuant to "Overhead" of these special provisions, shall be considered as included in the markups specified above, and no additional compensation will be allowed therefor.

When extra work to be paid for on a force account basis is performed by a subcontractor, approved in conformance with the provisions in Section 8-1.01, "Subcontracting," of the Standard Specifications, an additional markup of 7 percent will be added to the total cost of that extra work including all markups specified in this section "Force Account Payment". The additional 7 percent markup shall reimburse the Contractor for additional administrative costs, and no other additional payment will be made by reason of performance of the extra work by a subcontractor.

#### **5-1.13 AREAS FOR CONTRACTOR'S USE**

Attention is directed to the provisions in Section 7-1.19, "Rights in Land and Improvements," of the Standard Specifications and these special provisions.

The highway right of way shall be used only for purposes that are necessary to perform the required work. The Contractor shall not occupy the right of way, or allow others to occupy the right of way, for purposes which are not necessary to perform the required work.

No State-owned parcels adjacent to the right of way are available for the exclusive use of the Contractor within the contract limits. The Contractor shall secure, at the Contractor's own expense, areas required for plant sites, storage of equipment or materials, or for other purposes.

No area is available within the contract limits for the exclusive use of the Contractor. However, temporary storage of equipment and materials on State property may be arranged with the Engineer. Use of the Contractor's work areas and other State-owned property shall be at the Contractor's own risk, and the State shall not be held liable for damage to or loss of materials or equipment located within such areas.

#### **5-1.14 PAYMENTS**

Attention is directed to Sections 9-1.06, "Partial Payments," and 9-1.07, "Payment After Acceptance," of the Standard Specifications and these special provisions.

For the purpose of making partial payments pursuant to Section 9-1.06, "Partial Payments," of the Standard Specifications, the amount set forth for the contract items of work hereinafter listed shall be deemed to be the maximum value of the contract item of work which will be recognized for progress payment purposes:

- A. Clearing and Grubbing      \$9,000

After acceptance of the contract pursuant to the provisions in Section 7-1.17, "Acceptance of Contract," of the Standard Specifications, the amount, if any, payable for a contract item of work in excess of the maximum value for progress payment purposes hereinabove listed for the item, will be included for payment in the first estimate made after acceptance of the contract.

In determining the partial payments to be made to the Contractor, only the following listed materials will be considered for inclusion in the payment as materials furnished but not incorporated in the work:

- A. Steel Piling
- B. Cast-in-Steel Shell (CISS) Piling
- C. Joint Seal
- D. Bar Reinforcing Steel (Bridge)

The first sentence in the third paragraph of Section 8-1.01, "Subcontracting," of the Standard Specifications shall not apply.

The Contractor shall perform with the Contractor's own organization contract work amounting to not less than 30 percent of the original total contract price, except that any designated "Specialty Items" may be performed by subcontract and the amount of "Specialty Items" so performed may be deducted from the original total contract price before computing the amount of work required to be performed by the Contractor with the Contractor's own organization.

#### **5-1.15 STRUCTURE DEMOLITION ASBESTOS-CONTAINING MATERIAL**

Asbestos-containing material (ACM), as defined in Section 1529, "Asbestos," of the Construction Safety Orders, Title 8, of the California Code of Regulations, is suspected within the structure. Potential asbestos-containing material (PACM) is also suspected as being present in expansion assemblies of the original structure.

Permits- The Contractor shall notify the Lake County Air Quality Management District **885 Lakeport Blvd. Lakeport, CA 95453, telephone (707) 263 7000** as required by NESHAP, 40CFR Part 61, and California Air Resources Control Board rules. A copy of the notification form and attachments shall be provided to the Engineer prior to submittal to the Air Quality Management District. Notification shall take place a minimum of 10 days prior to demolition

Testing of PACM shall be done when the first expansion assembly is opened. A minimum of 4 samples shall be taken of PACM prior to removal or disturbance of PACM in the locations noted above. If in the demolition process, PACM is made friable or damaged, this material shall be covered or sealed until sample results confirm or clear the material of asbestos. Sample analysis shall be by a laboratory registered by the State of California using Polarized Light Microscopy (PLM). Sample results shall be transmitted to the Engineer prior to any PACM removal.

Removal and management of ACM/PACM- All work shall be performed by a contractor who is registered pursuant to Section 6501.5 of the Labor Code and certified pursuant to Section 7058.6 of the Business and Professions Code. Asbestos removal shall conform to CAL OSHA requirements in Title 8 Sections 1529 and 341. Packaging, storage, transporting, and disposing of ACM shall conform to Title 22, Division 4, Chapter 30

All friable material shall be removed in a manner which conforms to CAL OSHA work practice requirements. All non-friable ACM shall be removed and handled to prevent breakage.

Safety- Attention is directed to Section 7-1.06, "Safety and Health Provisions," of the Standard Specifications. Work practices and worker health and safety during any work that results in disturbance of ACM shall conform to Section 1529, "Asbestos," of the Construction Safety Orders, Title 8, of the California Code of Regulations. Written notification of exposure monitoring results shall be submitted to the Engineer upon its completion. Any required written certification of the adequacy of alternative work practices shall be submitted to the Engineer before performing any work. The Contractor shall certify in writing that the personnel performing the work have completed a training program appropriate for the work involved.

The requirements of subsection (d), "Multi-Employer Worksites," of Section 1529, "Asbestos," of the Construction Safety Orders, Title 8, of the California Code of Regulations shall be observed during performance of the work. This shall not be construed as relieving the Contractor from the Contractor's responsibilities as provided in Section 8-1.01, "Subcontracting," of the Standard Specifications.

Payment- Full compensation for conforming to the requirements of this section shall be considered as included in the contract price paid for the items involved and no additional compensation will be allowed therefor.

Removal and disposal of potential asbestos containing material (PACM) will be paid for as extra work as provided in Section 4-1.03D of the Standard Specifications.

#### **5-1.16 RELATIONS WITH CALIFORNIA DEPARTMENT OF FISH AND GAME**

A portion of this project is located within the jurisdiction of the California Department of Fish and Game. An agreement regarding a stream or lake has been entered into by the Department of Transportation and the Department of Fish and Game. The Contractor shall be fully informed of the requirements of this agreement as well as rules, regulations, and conditions that may govern the Contractor's operations in these areas and shall conduct the work accordingly.

Copies of the agreement may be obtained at the Department of Transportation, Plans and Bid Documents Section, MS 26, 1120 N Street, Room 200, Sacramento, CA 95814, Telephone 916-654-4490, and are available for inspection at the office of the District Director of Transportation at the Northern Region Construction Office at 379-A Colusa Highway, Yuba City, California 95991.

It is unlawful for any person to divert, obstruct or change the natural flow of the bed, channel or bank of a stream, river or lake without first notifying the Department of Fish and Game, unless the project or activity is noticed and constructed in conformance with conditions imposed under Fish and Game Code Section 1601.

Attention is directed to Sections 7-1.01, "Laws to be Observed," 7-1.01G, "Water Pollution," and 7-1.12, "Indemnification and Insurance," of the Standard Specifications.

Modifications to the agreement between the Department of Transportation and the Department of Fish and Game which are proposed by the Contractor shall be submitted in writing to the Engineer for transmittal to the Department of Fish and Game for their consideration.

When the Contractor is notified by the Engineer that a modification to the agreement is under consideration, no work shall be performed which is inconsistent with the original agreement or proposed modification until the Departments take action on the proposed modifications. Compensation for delay will be determined in conformance with the provisions in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

The provisions of this section shall be made a part of every subcontract executed pursuant to this contract.

Modifications to any agreement between the Department of Transportation and the Department of Fish and Game will be fully binding on the Contractor. The provisions of this section shall be made a part of every subcontract executed pursuant to this contract.

#### **5-1.17 RELATIONS WITH CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD**

The location of the Putah Creek Bridge is within an area controlled by the Regional Water Quality Control Board. Regional Water Quality Control Board Waiver has been issued covering work to be performed under this contract. The Contractor shall be fully informed of rules, regulations, and conditions that may govern the Contractor's operations in the areas and shall conduct the work accordingly.

Copies of the order may be obtained at the Department of Transportation, Plans and Bid Documents Section, MS 26, 1120 N Street, Room 200, Sacramento, CA 95814, Telephone 916-654-4490, and are available for inspection at the office of the District Director of Transportation at the Northern Region Construction Office at 379-A Colusa Highway, Yuba City, California 95991.

Attention is directed to Section 7-1.11, "Preservation of Property," and Section 7-1.12, "Indemnification and Insurance," of the Standard Specifications.

Changes in the conditions listed in the aforementioned permit proposed by the Contractor shall be submitted to the Engineer for transmittal to the Regional Water Quality Control Board for their approval. Changes shall not be implemented until approved in writing by the Regional Water Quality Control Board.

Attention is directed to Section 8-1.06, "Time of Completion," of the Standard Specifications. Days during which the Contractor's operations are restricted in the floodway by the requirements of this section shall be considered to be nonworking days if these restrictions cause a delay in the current controlling operation or operations.

#### **5-1.18 RELATIONS WITH U.S. ARMY CORPS OF ENGINEERS**

The location of the project is within an area controlled by the U.S. Army Corps of Engineers. A U.S. Army Corps of Engineers permit has been issued covering work to be performed under this contract. The Contractor shall be fully informed of rules, regulations, and conditions that may govern the Contractor's operations in the areas and shall conduct the work accordingly.

Copies of the permit may be obtained at the Department of Transportation, Plans and Bid Documents Section, MS 26, 1120 N Street, Room 200, Sacramento, CA 95814, Telephone 916-654-4490, and are available for inspection at the office of the District Director of Transportation at the Northern Region Construction Office at 379-A Colusa Highway, Yuba City, California 95991.

Attention is directed to Section 7-1.11, "Preservation of Property," and Section 7-1.12, "Indemnification and Insurance," of the Standard Specifications.

Changes in the conditions listed in the aforementioned permit proposed by the Contractor shall be submitted to the Engineer for transmittal to the U.S. Army Corps of Engineers for their approval. Changes shall not be implemented until approved in writing by the U.S. Army Corps of Engineers.

#### **SECTION 6. (BLANK)**

#### **SECTION 7. (BLANK)**

#### **SECTION 8. MATERIALS**

#### **SECTION 8-1. MISCELLANEOUS**

#### **8-1.01 SUBSTITUTION OF NON-METRIC MATERIALS AND PRODUCTS**

Only materials and products conforming to the requirements of the specifications shall be incorporated in the work. When metric materials and products are not available, and when approved by the Engineer, and at no cost to the State, materials and products in the inch-pound (Imperial) system which are of equal quality and of the required properties and characteristics for the purpose intended, may be substituted for the equivalent metric materials and products, subject to the following provisions:

- A. Materials and products shown on the plans or in the special provisions as being equivalent may be substituted for the metric materials and products specified or detailed on the plans.
- B. Before other non-metric materials and products will be considered for use the Contractor shall furnish, at the Contractor's expense, evidence satisfactory to the Engineer that the materials and products proposed for use are equal to or better than the materials and products specified or detailed on the plans. The burden of proof as to the quality and suitability of substitutions shall be upon the Contractor and the Contractor shall furnish necessary information as required by the Engineer. The Engineer will be the sole judge as to the quality and suitability of the substituted materials and products and the Engineer's decision will be final.
- C. When the Contractor elects to substitute non-metric materials and products, including materials and products shown on the plans or in the special provisions as being equivalent, the list of sources of material as specified in Section 6-1.01, "Source of Supply and Quality of Materials," of the Standard Specification shall include a list of substitutions to be made and contract items involved. In addition, for a change in design or details the Contractor shall submit plans and working drawings in conformance with the provisions in Section 5-1.02, "Plans and Working Drawings," of the Standard Specifications.

Unless otherwise specified, the following substitutions of materials and products will be allowed:

#### SUBSTITUTION TABLE FOR SIZES OF HIGH STRENGTH STEEL FASTENERS

ASTM Designation: A 325M

| METRIC SIZE SHOWN ON THE PLANS<br>mm x thread pitch | IMPERIAL SIZE TO BE SUBSTITUTED<br>inch |
|---|---|
| M16 x 2   | 5/8                                     |
| M20 x 2.5   | 3/4                                     |
| M22 x 2.5   | 7/8                                     |
| M24 x 3   | 1                                       |
| M27 x 3   | 1-1/8                                   |
| M30 x 3.5   | 1-1/4                                   |
| M36 x 4   | 1-1/2                                   |

#### SUBSTITUTION TABLE FOR PLAIN WIRE REINFORCEMENT, ASTM Designation: A 82

| METRIC SIZE SHOWN ON THE PLANS<br>mm <sup>2</sup> | US CUSTOMARY UNITS SIZE TO BE SUBSTITUTED<br>inch <sup>2</sup> x 100 |
|---|--|
| MW9   | W1.4   |
| MW10  | W1.6   |
| MW13  | W2.0   |
| MW15  | W2.3   |
| MW19  | W2.9   |
| MW20  | W3.1   |
| MW22  | W3.5   |
| MW25  | W3.9, except W3.5 in piles only                                      |
| MW26  | W4.0   |
| MW30  | W4.7   |
| MW32  | W5.0   |
| MW35  | W5.4   |
| MW40  | W6.2   |
| MW45  | W6.5   |
| MW50  | W7.8   |
| MW55  | W8.5, except W8.0 in piles only                                      |
| MW60  | W9.3   |
| MW70  | W10.9, except W11.0 in piles only                                    |
| MW80  | W12.4  |
| MW90  | W14.0  |
| MW100   | W15.5  |

**SUBSTITUTION TABLE FOR BAR REINFORCEMENT**

| <b>METRIC BAR DESIGNATION<br/>NUMBER SHOWN ON THE PLANS</b> | <b>EQUIVALENT IMPERIAL BAR DESIGNATION<br/>NUMBER TO BE SUBSTITUTED</b> |
|---|---|
| 13  | 4   |
| 16  | 5   |
| 19  | 6   |
| 22  | 7   |
| 25  | 8   |
| 29  | 9   |
| 32  | 10  |
| 36  | 11  |
| 43  | 14  |
| 57  | 18  |

No adjustment will be required in spacing or total number of reinforcing bars due to a difference in minimum yield strength between metric and non-metric bars.

The sizes in the following tables of materials and products are exact conversions of metric sizes of materials and products and are listed as acceptable equivalents:

**CONVERSION TABLE FOR SIZES OF:**

- (1) STEEL FASTENERS FOR GENERAL APPLICATIONS, ASTM Designation: A 307 or AASHTO Designation: M 314, Grade 36 or 55, and
- (2) HIGH STRENGTH STEEL FASTENERS, ASTM Designation: A 325 or A 449

| <b>METRIC SIZE SHOWN ON THE PLANS<br/>mm</b> | <b>EQUIVALENT IMPERIAL SIZE<br/>inch</b> |
|--|--|
| 6, or 6.35                                   | 1/4                                      |
| 8 or 7.94                                    | 5/16                                     |
| 10, or 9.52                                  | 3/8                                      |
| 11, or 11.11                                 | 7/16                                     |
| 13 or 12.70                                  | 1/2                                      |
| 14, or 14.29                                 | 9/16                                     |
| 16, or 15.88                                 | 5/8                                      |
| 19, or 19.05                                 | 3/4                                      |
| 22, or 22.22                                 | 7/8                                      |
| 24, 25, or 25.40                             | 1  |
| 29, or 28.58                                 | 1-1/8                                    |
| 32, or 31.75                                 | 1-1/4                                    |
| 35, or 34.93                                 | 1-3/8                                    |
| 38 or 38.10                                  | 1-1/2                                    |
| 44, or 44.45                                 | 1-3/4                                    |
| 51, or 50.80                                 | 2  |
| 57, or 57.15                                 | 2-1/4                                    |
| 64, or 63.50                                 | 2-1/2                                    |
| 70 or 69.85                                  | 2-3/4                                    |
| 76, or 76.20                                 | 3  |
| 83, or 82.55                                 | 3-1/4                                    |
| 89 or 88.90                                  | 3-1/2                                    |
| 95, or 95.25                                 | 3-3/4                                    |
| 102, or 101.60                               | 4  |

**CONVERSION TABLE FOR NOMINAL THICKNESS OF SHEET METAL**

| UNCOATED HOT AND COLD ROLLED SHEETS    |                                | HOT-DIPPED ZINC COATED SHEETS<br>(GALVANIZED) |  |
|--|--------------------------------|---|--|
| METRIC THICKNESS<br>SHOWN ON THE PLANS | EQUIVALENT US<br>STANDARD GAGE | METRIC THICKNESS<br>SHOWN ON THE PLANS        | EQUIVALENT<br>GALVANIZED<br>SHEET GAGE |
| mm                                     | inch                           | mm  | inch                                   |
| 7.94                                   | 0.3125                         | 4.270   | 0.1681                                 |
| 6.07                                   | 0.2391                         | 3.891   | 0.1532                                 |
| 5.69                                   | 0.2242                         | 3.510   | 0.1382                                 |
| 5.31                                   | 0.2092                         | 3.132   | 0.1233                                 |
| 4.94                                   | 0.1943                         | 2.753   | 0.1084                                 |
| 4.55                                   | 0.1793                         | 2.372   | 0.0934                                 |
| 4.18                                   | 0.1644                         | 1.994   | 0.0785                                 |
| 3.80                                   | 0.1495                         | 1.803   | 0.0710                                 |
| 3.42                                   | 0.1345                         | 1.613   | 0.0635                                 |
| 3.04                                   | 0.1196                         | 1.461   | 0.0575                                 |
| 2.66                                   | 0.1046                         | 1.311   | 0.0516                                 |
| 2.28                                   | 0.0897                         | 1.158   | 0.0456                                 |
| 1.90                                   | 0.0747                         | 1.006 or 1.016                                | 0.0396                                 |
| 1.71                                   | 0.0673                         | 0.930   | 0.0366                                 |
| 1.52                                   | 0.0598                         | 0.853   | 0.0336                                 |
| 1.37                                   | 0.0538                         | 0.777   | 0.0306                                 |
| 1.21                                   | 0.0478                         | 0.701   | 0.0276                                 |
| 1.06                                   | 0.0418                         | 0.627   | 0.0247                                 |
| 0.91                                   | 0.0359                         | 0.551   | 0.0217                                 |
| 0.84                                   | 0.0329                         | 0.513   | 0.0202                                 |
| 0.76                                   | 0.0299                         | 0.475   | 0.0187                                 |
| 0.68                                   | 0.0269                         | -----   | -----                                  |
| 0.61                                   | 0.0239                         | -----   | -----                                  |
| 0.53                                   | 0.0209                         | -----   | -----                                  |
| 0.45                                   | 0.0179                         | -----   | -----                                  |
| 0.42                                   | 0.0164                         | -----   | -----                                  |
| 0.38                                   | 0.0149                         | -----   | -----                                  |



**CONVERSION TABLE FOR WIRE**

| METRIC THICKNESS<br>SHOWN ON THE PLANS<br>mm | EQUIVALENT USA STEEL<br>WIRE THICKNESS<br>inch | GAGE NO. |
|--|--|----------|
| 6.20   | 0.244  | 3        |
| 5.72   | 0.225  | 4        |
| 5.26   | 0.207  | 5        |
| 4.88   | 0.192  | 6        |
| 4.50   | 0.177  | 7        |
| 4.11   | 0.162  | 8        |
| 3.76   | 0.148  | 9        |
| 3.43   | 0.135  | 10       |
| 3.05   | 0.120  | 11       |
| 2.69   | 0.106  | 12       |
| 2.34   | 0.092  | 13       |
| 2.03   | 0.080  | 14       |
| 1.83   | 0.072  | 15       |
| 1.57   | 0.062  | 16       |
| 1.37   | 0.054  | 17       |
| 1.22   | 0.048  | 18       |
| 1.04   | 0.041  | 19       |
| 0.89   | 0.035  | 20       |

**CONVERSION TABLE FOR PIPE PILES**

| METRIC SIZE<br>SHOWN ON THE PLANS<br>mm x mm | EQUIVALENT IMPERIAL SIZE<br>inch x inch |
|--|---|
| PP 360 x 4.55                                | NPS 14 x 0.179                          |
| PP 360 x 6.35                                | NPS 14 x 0.250                          |
| PP 360 x 9.53                                | NPS 14 x 0.375                          |
| PP 360 x 11.12                               | NPS 14 x 0.438                          |
| PP 406 x 12.70                               | NPS 16 x 0.500                          |
| PP 460 x T                                   | NPS 18 x T"                             |
| PP 508 x T                                   | NPS 20 x T"                             |
| PP 559 x T                                   | NPS 22 x T"                             |
| PP 610 x T                                   | NPS 24 x T"                             |
| PP 660 x T                                   | NPS 26 x T"                             |
| PP 711 x T                                   | NPS 28 x T"                             |
| PP 762 x T                                   | NPS 30 x T"                             |
| PP 813 x T                                   | NPS 32 x T"                             |
| PP 864 x T                                   | NPS 34 x T"                             |
| PP 914 x T                                   | NPS 36 x T"                             |
| PP 965 x T                                   | NPS 38 x T"                             |
| PP 1016 x T                                  | NPS 40 x T"                             |
| PP 1067 x T                                  | NPS 42 x T"                             |
| PP 1118 x T                                  | NPS 44 x T"                             |
| PP 1219 x T                                  | NPS 48 x T"                             |
| PP 1524 x T                                  | NPS 60 x T"                             |

The thickness in inches (T") represents an exact conversion of the metric thickness in millimeters (T).

**CONVERSION TABLE FOR STRUCTURAL TIMBER AND LUMBER**

| METRIC MINIMUM<br>DRESSED DRY,<br>SHOWN ON THE PLANS<br>mm x mm | METRIC MINIMUM<br>DRESSED GREEN,<br>SHOWN ON THE PLANS<br>mm x mm | EQUIVALENT NOMINAL<br>US SIZE<br>inch x inch |
|---|---|--|
| 19x89   | 20x90   | 1x4  |
| 38x89   | 40x90   | 2x4  |
| 64x89   | 65x90   | 3x4  |
| 89x89   | 90x90   | 4x4  |
| 140x140   | 143x143   | 6x6  |
| 140x184   | 143x190   | 6x8  |
| 184x184   | 190x190   | 8x8  |
| 235x235   | 241x241   | 10x10  |
| 286x286   | 292x292   | 12x12  |

**CONVERSION TABLE FOR NAILS AND SPIKES**

| METRIC COMMON NAIL,<br>SHOWN ON THE PLANS<br><br>Length, mm<br>Diameter, mm | METRIC BOX NAIL,<br>SHOWN ON THE PLANS<br><br>Length, mm<br>Diameter, mm | METRIC SPIKE,<br>SHOWN ON THE<br>PLANS<br>Length, mm<br>Diameter, mm | EQUIVALENT<br>IMPERIAL SIZE<br><br>Penny-weight |
|---|--|--|---|
| 50.80<br>2.87   | 50.80<br>2.51  | ————   | 6d  |
| 63.50<br>3.33   | 63.50<br>2.87  | ————   | 8d  |
| 76.20<br>3.76   | 76.20<br>3.25  | 76.20<br>4.88  | 10d   |
| 82.55<br>3.76   | 82.55<br>3.25  | 82.55<br>4.88  | 12d   |
| 88.90<br>4.11   | 88.90<br>3.43  | 88.90<br>5.26  | 16d   |
| 101.60<br>4.88  | 101.60<br>3.76   | 101.60<br>5.72   | 20d   |
| 114.30<br>5.26  | 114.30<br>3.76   | 114.30<br>6.20   | 30d   |
| 127.00<br>5.72  | 127.00<br>4.11   | 127.00<br>6.68   | 40d   |
| ————  | ————   | 139.70<br>7.19   | 50d   |
| ————  | ————   | 152.40<br>7.19   | 60d   |

**CONVERSION TABLE FOR IRRIGATION COMPONENTS**

| <b>METRIC</b><br><b>WATER METERS, TRUCK</b><br><b>LOADING STANDPIPES,</b><br><b>VALVES, BACKFLOW</b><br><b>PREVENTERS, FLOW</b><br><b>SENSORS, WYE</b><br><b>STRAINERS, FILTER</b><br><b>ASSEMBLY UNITS, PIPE</b><br><b>SUPPLY LINES, AND PIPE</b><br><b>IRRIGATION SUPPLY</b><br><b>LINES</b><br><b>SHOWN ON THE PLANS</b><br><b>DIAMETER NOMINAL (DN)</b><br><b>mm</b> | <b>EQUIVALENT NOMINAL</b><br><b>US SIZE</b><br><b>inch</b> |
|--|--|
| 15   | 1/2  |
| 20   | 3/4  |
| 25   | 1  |
| 32   | 1-1/4  |
| 40   | 1-1/2  |
| 50   | 2  |
| 65   | 2-1/2  |
| 75   | 3  |
| 100  | 4  |
| 150  | 6  |
| 200  | 8  |
| 250  | 10   |
| 300  | 12   |
| 350  | 14   |
| 400  | 16   |

#### **8-1.02 APPROVED TRAFFIC PRODUCTS**

The Department maintains the following list of Approved Traffic Products. The Engineer shall not be precluded from sampling and testing products on the list of Approved Traffic Products.

The manufacturer of products on the list of Approved Traffic Products shall furnish the Engineer a Certificate of Compliance in conformance with the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications for each type of traffic product supplied.

Signing and delineation materials and products shall not be used in the work unless the material or product is on the list of Approved Traffic Products.

Materials and products may be added to the list of Approved Traffic Products if the manufacturer submits a New Product Information Form to the New Product Coordinator at the Transportation Laboratory. Upon a Departmental request for samples, sufficient samples shall be submitted to permit performance of required tests. Approval of materials or products will depend upon compliance with the specifications and tests the Department may elect to perform.

#### **PAVEMENT MARKERS, PERMANENT TYPE**

##### **Retroreflective**

- A. Apex, Model 921 (100 mm x 100 mm)
- B. Ray-O-Lite, Models SS (100 mm x 100 mm), RS (100 mm x 100 mm) and AA (100 mm x 100 mm)
- C. Stimsonite, Models 88 (100 mm x 100 mm), 911 (100 mm x 100 mm), 953 (70 mm x 114 mm)
- D. 3M Series 290 (89 mm x 100 mm)

##### **Retroreflective With Abrasion Resistant Surface (ARS)**

- A. Ray-O-Lite "AA" ARS (100 mm x 100 mm)
- B. Stimsonite, Models 911 (100 mm x 100 mm), 953 (70 mm x 114 mm)
- C. 3M Series 290 (89 mm x 100 mm)

### **Retroreflective With Abrasion Resistant Surface (ARS)**

(Used for recessed applications)

- A. Stimsonite, Model 948 (58 mm x 119 mm)
  - B. Ray-O-Lite, Model 2002 (58 mm x 117 mm)
  - C. Stimsonite, Model 944SB (51 mm x 100 mm)\*
  - D. Ray-O-Lite, Model 2004 ARS (51 mm x 100 mm)\*
- \*For use only in 114 mm wide (older) recessed slots

### **Non-Reflective For Use With Epoxy Adhesive, 100 mm Round**

- A. Apex Universal (Ceramic)
- B. Highway Ceramics, Inc. (Ceramic)

### **Non-Reflective For Use With Bitumen Adhesive, 100 mm Round**

- A. Apex Universal (Ceramic)
- B. Apex Universal, Model 929 (ABS)
- C. Elgin Molded Plastics, "Empco-Lite" Model 900 (ABS)
- D. Highway Ceramics, Inc. (Ceramic)
- E. Hi-Way Safety, Inc., Models P20-2000W and 2001Y (ABS)
- F. Interstate Sales, "Diamond Back" (ABS) and (Polypropylene)
- G. Alpine Products, D-Dot (ABS)
- H. Road Creations, Model RCB4NR (Acrylic)

## **PAVEMENT MARKERS, TEMPORARY TYPE**

### **Temporary Markers For Long Term Day/Night Use (6 months or less)**

- A. Apex Universal, Model 924 (100 mm x 100 mm)
- B. Davidson Plastics Corp., Model 3.0 (100 mm x 100 mm)
- C. Elgin Molded Plastics, "Empco-Lite" Model 901 (100 mm x 100 mm)
- D. Road Creations, Model R41C (100 mm x 100 mm)
- E. Vega Molded Products "Temporary Road Marker" (75 mm x 100 mm)

### **Temporary Markers For Short Term Day/Night Use (14 days or less)**

(For seal coat or chip seal applications, clear protective covers are required)

- A. Apex Universal, Model 932
- B. Davidson Plastics, Models T.O.M., T.R.P.M., and "HH" (High Heat)
- C. Hi-Way Safety, Inc., Model 1280/1281

## **STRIPING AND PAVEMENT MARKING MATERIALS**

### **Permanent Traffic Striping and Pavement Marking Tape**

- A. Advanced Traffic Marking, Series 300 and 400
- B. Brite-Line, Series 1000
- C. Swarco Industries, "Director 35" (For transverse application only)
- D. Swarco Industries, "Director 60"
- E. 3M, "Stamark" Series 380 and 5730
- F. 3M, "Stamark" Series 420 (For transverse application only)

### **Temporary (Removable) Striping and Pavement Marking Tape (6 months or less)**

- A. Brite-Line, Series 100
- B. P.B. Laminations, Aztec, Grade 102
- C. Swarco Industries, "Director-2"
- D. 3M, "Stamark," Series 620
- E. 3M Series A145 Removable Black Line Mask  
(Black Tape: For use only on Asphalt Concrete Surfaces)
- F. Advanced Traffic Marking Black "Hide-A-Line"  
(Black Tape: For use only on Asphalt Concrete Surfaces)

**Preformed Thermoplastic (Heated in place)**

- A. Flint Trading, "Premark" and "Premark 20/20 Flex"
- B. Pavemark, "Hotape"

**Removable Traffic Paint**

- A. Belpro, Series 250/252 and No. 93 Remover

**CLASS 1 DELINEATORS**

**One Piece Driveable Flexible Type, 1700 mm**

- A. Carsonite, Curve-Flex CFRM-400
- B. Carsonite, Roadmarker CRM-375
- C. Davidson Plastics, "Flexi-Guide Models 400 and 566"
- D. FlexStake, Model 654TM
- E. GreenLine Models HWD1-66 and CGD1-66
- F. J. Miller Industries, Model JMI-375 (with soil anchor)

**Special Use Flexible Type, 1700 mm**

- A. Carsonite, "Survivor" (with 450 mm U-Channel base)
- B. FlexStake, Model 604
- C. GreenLine Models HWD and CGD (with 450 mm U-Channel base)
- D. Safe-Hit with 200 mm pavement anchor (SH248-GP1)
- E. Safe-Hit with 380 mm soil anchor (SH248-GP2) and with 450 mm soil anchor (SH248-GP3)

**Surface Mount Flexible Type, 1200 mm**

- A. Bent Manufacturing Company, "Masterflex" Model MF-180EX-48
- B. Carsonite, "Super Duck II"
- C. FlexStake, Surface Mount, Models 704 and 754TM

**CHANNELIZERS**

**Surface Mount Type, 900 mm**

- A. Bent Manufacturing Company, "Masterflex" Models MF-360-36 (Round) and MF-180-36 (Flat)
- B. Carsonite, "Super Duck" (Flat SDF-436, Round SDR-336)
- C. Carsonite, "Super Duck II" Model SDCF203601MB "The Channelizer"
- D. Davidson Plastics, Flex-Guide Models FG300LD and FG300UR
- E. FlexStake, Surface Mount, Models 703 and 753TM
- F. GreenLine, Model SMD-36
- G. Hi-Way Safety, Inc. "Channel Guide Channelizer" Model CGC36
- H. The Line Connection, "Dura-Post" Model DP36-3 (Permanent)
- I. The Line Connection, "Dura-Post" Model DP36-3C (Temporary)
- J. Repo, Models 300 and 400
- K. Safe-Hit, Guide Post, Model SH236SMA

**CONICAL DELINEATORS, 1070 mm**

(For 700 mm Traffic Cones, see Standard Specifications)

- A. Bent Manufacturing Company "T-Top"
- B. Plastic Safety Systems "Navigator-42"
- C. Roadmaker Company "Stacker"
- D. Traffix Devices "Grabber"

**OBJECT MARKERS**

**Type "K", 450 mm**

- A. Carsonite, Model SMD-615
- B. FlexStake, Model 701KM
- C. Repo, Models 300 and 400
- D. Safe-Hit, Model SH718SMA
- E. The Line Connection, Model DP21-4K

**Type "K-4" / "Q", 600 mm**

(Shown as Type "Q" in the Traffic Manual)

- A. Bent Manufacturing "Masterflex" Model MF-360-24
- B. Carsonite, Super Duck II
- C. FlexStake, Model 701KM
- D. Repo, Models 300 and 400
- E. Safe-Hit, Models SH8 24SMA\_WA and SH8 24GP3\_WA
- F. The Line Connection, Model DP21-4Q

**TEMPORARY RAILING (TYPE K) REFLECTORS AND CONCRETE BARRIER MARKERS**

**Impactable Type**

- A. ARTUK, "FB"
- B. Davidson Plastics, Model PCBM-12
- C. Duraflex Corp., "Flexx 2020" and "Electriflexx"
- D. Hi-Way Safety, Inc., Model GMKRM100

**Non-Impactable Type**

- A. ARTUK, JD Series
- B. Stimsonite, Model 967 (with 83 mm Acrylic cube corner reflector)
- C. Stimsonite, Model 967LS
- D. Vega Molded Products, Models GBM and JD

**THREE BEAM BARRIER MARKERS**

(For use to the left of traffic)

- A. Duraflex Corp., "Railrider"
- B. Davidson Plastics, "Mini" (75 mm x 254 mm)

**CONCRETE BARRIER DELINEATORS, 400 mm**

(For use to the right of traffic. When mounted on top of barrier, places top of reflective element at 1200 mm)

- A. Davidson Plastics, Model PCBM T-16
- B. Safe-Hit, Model SH216RBM

**CONCRETE BARRIER-MOUNTED MINI-DRUM (260 mm x 360 mm x 570 mm)**

- A. Stinson Equipment Company "SaddleMarker"

**SOUND WALL DELINEATOR**

(Applied to a vertical surface. Top of reflective element at 1200 mm)

- A. Davidson Plastics, PCBM S-36

**GUARD RAILING DELINEATOR**

(Top of reflective element at 1200 mm above plane of roadway)

**Wood Post Type, 686 mm**

- A. Carsonite, Model 427
- B. Davidson Plastics FG 427 and FG 527
- C. FlexStake, Model 102 GR
- D. GreenLine GRD 27
- E. J. Miller Model JMI-375G
- F. Safe-Hit, Model SH227GRD

**Steel Post Type**

- A. Carsonite, Model CFGR-327 with CFGRBK300 Mounting Bracket

## **RETROREFLECTIVE SHEETING**

### **Channelizers, Barrier Markers, and Delineators**

- A. 3M, High Intensity
- B. Reflexite, PC-1000 Metalized Polycarbonate
- C. Reflexite, AC-1000 Acrylic
- D. Reflexite, AP-1000 Metalized Polyester
- E. Reflexite, AR-1000 Abrasion Resistant Coating
- F. Stimsonite, Series 6200 (For rigid substrate devices only)

### **Traffic Cones, 330 mm Sleeves**

- A. Reflexite SB (Polyester), Vinyl or "TR" (Semi-transparent)

### **Traffic Cones, 100 mm and 150 mm Sleeves**

- A. 3M Series 3840
- B. Reflexite Vinyl, "TR" (Semi-transparent) or "Conformalite"

### **Barrels and Drums**

- A. Reflexite, "Super High Intensity" or "High Impact Drum Sheeting"
- B. 3M Series 3810

### **Barricades: Type I, Engineer Grade**

- A. American Decal, Adcolite
- B. Avery Dennison, 1500 and 1600
- C. 3M, Scotchlite, Series CW

### **Barricades: Type II, Super Engineer Grade**

- A. Avery Dennison, "Fasign" 2500 Series
- B. Kiwalite Type II
- C. Nikkalite 1800 Series

### **Signs: Type II, Super Engineer Grade**

- A. Avery Dennison, "Fasign" 2500 Series
- B. Kiwalite, Type II
- C. Nikkalite 1800 Series

### **Signs: Type III, High-Intensity Grade**

- A. 3M Series 3800
- B. Nippon Carbide, Nikkalite Brand Ultralite Grade II

### **Signs: Type IV, High-Intensity Prismatic Grade**

- A. Stimsonite Series 6200

### **Signs: Type VII, High-Intensity Prismatic Grade**

- A. 3M Series 3900

### **Signs: Type VI, Roll-Up Signs**

- A. Reflexite, Vinyl (Orange), Reflexite "SuperBright" (Fluorescent orange)
- B. 3M Series RS34 (Orange) and RS20 (Fluorescent orange)

## **SIGN SUBSTRATE FOR CONSTRUCTION AREA SIGNS**

### **Aluminum**

### **Fiberglass Reinforced Plastic (FRP)**

- A. Sequentia, "Polyplate"
- B. Fiber-Brite

### 8-1.03 ASPHALT

The first paragraph and tables following the first paragraph in Section 92-1.02, "Grades," of the Standard Specifications shall not apply.

The grade of asphalt to be used will be specified in "Asphalt Concrete" of these special provisions. The safe transportation, storage, use, and disposal of the asphalt specified shall be the responsibility of the Contractor.

A Certificate of Compliance, as specified in Section 92-1.03, "Test Report," of the Standard Specifications, shall accompany each shipment of asphalt to the project. When PBA Grade 6a, 6b or 7 is specified, the Certificate of Compliance shall include actual results of tests completed by the producer in addition to the items enumerated in Section 92-1.03 of the Standard Specifications. The Certificate of Compliance shall verify that the results of AASHTO Test Method T240 (Mass Loss after Rolling Thin Film Oven Test) indicate a maximum mass loss of 0.6 percent and that AASHTO Test Method T48 (Flash Point, Cleveland Open Cup) indicate a minimum flash point of 232°C. The actual formulation used by the asphalt producer shall be available to the Department upon written request. The Department will execute a non-disclosure agreement if requested by the asphalt producer.

For PBA Grades 6a, 6b or 7, if the results of mass loss after Rolling Thin Film Oven Test (AASHTO Test Method T240) or Flash Point, Cleveland Open Cup (AASHTO Test Method T48), shown on the Certificate of Compliance are not within the limits specified in the table entitled "PERFORMANCE BASED ASPHALT BINDER GRADES" or if the results are not shown on the Certificate of Compliance, the individual shipment of asphalt will be rejected. Rejected asphalt shall not be used on the project. Should rejected asphalt be unloaded into bulk storage tanks, asphalt from the tanks shall not be used on the project until tests and a Certificate of Compliance are furnished for the material and indicate compliance with the specifications.

Asphalt to be used as a binder for asphalt concrete will be sampled using the sampling device specified in Section 39-3.01C, "Asphalt Binder Storage," of the Standard Specifications. Two samples per operating day, each consisting of 2 one-liter containers, will be taken from the bulk storage tank feeder line.

For PBA Grades 6a, 6b or 7, if the test result of samples taken from the bulk storage tank, indicate mass loss greater than 0.6 percent, the material containing the paving asphalt represented by the tests shall be removed. However, if requested in writing by the Contractor and approved by the Engineer, the material containing the paving asphalt with mass loss greater than 0.6 percent may remain in place, and the Contractor shall pay to the State the amount calculated by the formulae listed below.

- A. For mass loss test results over 0.6 percent but less than or equal to 1.0 percent:
  - 1. (25 percent multiplied by 25 tonne average multiplied by the invoice price of paving asphalt)
- B. For mass loss test results over 1.0 percent:
  - 1. (100 percent multiplied by 25 tonne average multiplied by the invoice price of paving asphalt).
- C. The Department may deduct this amount from any moneys due, or that may become due, the Contractor under the contract. Each sample from the bulk storage shall represent 25 tonne average. The delivered price of the paving asphalt shall be based on a certified invoice provided by the Contractor.



**PERFORMANCE BASED ASPHALT BINDER GRADES**

| Specification Designation  | AASHTO<br>Test Method | PBA Grade             |                 |                 |                 |                 |
|--|-----------------------|-----------------------|-----------------|-----------------|-----------------|-----------------|
|  |                       | 1                     | 4               | 6a              | 6b              | 7               |
| Penetration<br>(25°C, 100g, 5s), dmm   |                       |                       |                 |                 |                 |                 |
| RTFO Aged Residue, Min (Note 1)  | T49                   | 25                    | 20              | —               | —               | —               |
| Absolute Viscosity<br>(60°C), Pa•s(x10 <sup>-1</sup> ) (Note 2)                |                       |                       |                 |                 |                 |                 |
| Original Binder, Min   | T202                  | 800                   | 2800            | 2000            | 2000            | 1100            |
| RTFO Aged Residue  | T202                  | 2500-5000<br>(Note 3) | 14 000 Max      | 5000 Min        | 5000 Min        | 3000 Min        |
| Kinematic Viscosity<br>(135°C), m <sup>2</sup> /s(x10 <sup>-6</sup> )          |                       |                       |                 |                 |                 |                 |
| Original Binder, Max.  | T201                  | —                     | —               | 2000            | 2000            | 2000            |
| RTFO Aged Residue, Min   | T201                  | 275                   | 350             | 275             | 275             | 275             |
| Absolute Viscosity Ratio<br>(60°C), Max  |                       |                       |                 |                 |                 |                 |
| RTFO Visc./Orig. Visc.   | —                     | 4.0                   | 4.0             | 4.0             | 4.0             | 4.0             |
| Flash Point, Cleveland Open Cup,<br>°C, (Note 4)                               |                       |                       |                 |                 |                 |                 |
| Original Binder, Min   | T48                   | 232                   | 232             | 232             | 232             | 232             |
| Mass Loss After RTFO Test, %<br>(Note 5)                                       | T240                  | Report<br>(Note 6)    | Report          | 0.60            | 0.60            | 0.60            |
| Solubility in Trichloroethylene, %<br>Original Binder, Min                     | T44                   | 99.0                  | 99.0            | Report          | Report          | Report          |
| Ductility<br>(25°C, 5 cm/min), cm  |                       |                       |                 |                 |                 |                 |
| RTFO Aged Residue, Min   | T51                   | 75                    | 50              | 60              | 60              | 75              |
| On Residue from Pav @:<br>or<br>Residue from Tilt Oven @<br>113°C for: (hours) | PP1<br><br>(Note 7)   | 90°C<br><br>18        | 100°C<br><br>36 | 100°C<br><br>36 | 100°C<br><br>36 | 110°C<br><br>72 |
| SSD -115(SSV)-50.6   | (Note 9)              | —                     | —               | —               | —               | 25°C            |
| Stiffness, 300 MPa, Max. @:<br>and M-value, 0.30, Min.                         | TP1                   | -6°C                  | -6°C            | -24°C           | -30°C           | -6°C            |

1. "RTFO Aged Residue" means the asphaltic residue obtained using the Rolling Thin Film Oven Test (RTFO Test), AASHTO Test Method T240 or ASTM Designation: D 2827.
2. The Absolute Viscosity (60°C) of PBA 6a, 6b, and 7 will be determined at 1 sec-1 using ASTM Designation: D 4957 with Asphalt Institute Vacuum Capillary Viscometers.
3. Where actual limits (e.g. 2500-5000) are indicated, the actual test results shall be part of the certified copy of test results, or shall be furnished with the Certificate of Compliance.
4. Actual results of the test shall be part of the certified copy of test results and when PBA Grade 6a, 6b or 7 is used an additional statement verifying an acceptable flash point shall be included with the Certificate of Compliance.
5. Actual results of the test shall be part of the certified copy of test results and when PBA Grade 6a, 6b or 7 is used an additional statement verifying an acceptable mass loss shall be included with the Certificate of Compliance.
6. Where "Report" is indicated, there is no requirement, however the actual results of the test shall be part of the certified copy of test results, or shall be furnished with the Certificate of Compliance.
7. "Tilt Oven Residue" means the asphalt obtained using California Test 374, Method B, "Method for Determining Asphalt Durability Using the California Tilt-Oven Durability Test".
8. SSD = Shear susceptibility of Delta, SSV = Shear susceptibility of Viscosity.
9. California Test 381.

#### **8-1.04 ENGINEERING FABRICS**

Engineering fabrics shall conform to the provisions in Section 88, "Engineering Fabrics," of the Standard Specifications and these special provisions.

Filter fabric for this project shall be ultraviolet (UV) ray protected.

### **SECTION 8-2. CONCRETE**

#### **8-2.01 PORTLAND CEMENT CONCRETE**

Portland cement concrete shall conform to the provisions in Section 90, "Portland Cement Concrete," of the Standard Specifications and these special provisions.

Unless the use of a mineral admixture is prohibited, whenever the word "cement" is used in the Standard Specifications or the special provisions, it shall be understood to mean "cementitious material" when both of the following conditions are met:

- A. The cement content of portland cement concrete is specified, and
- B. Section 90, "Portland Cement Concrete," of the Standard Specifications is referenced.

Portland cement concrete that is produced using equipment where the cement and mineral admixture are proportioned in the same weigh hopper shall be sampled and tested by the Contractor, in the presence of the Engineer, for mix uniformity in conformance with the requirements in ASTM Designation: C 94, Section 11, "Mixing and Delivery," and "Annex A1." The testing shall be performed on concrete produced using an approved project mix design and may be done at the project concrete placement site.

The batch plant producing the portland cement concrete for the project shall have met the requirements in California Test 109 within one year prior to producing concrete for the project.

Sampling for mix uniformity tests shall be performed the first time portland cement concrete, of sufficient volume to perform these tests, is placed on the project. Test results shall be presented to the Engineer no later than 10 days after completion of sampling.

Test results from mixer uniformity testing will not be used for contract compliance, acceptance or payment.

Prior to placing concrete on the project, the Contractor shall supply a list of portland cement concrete mixers to be used. When truck mixers are to be used, the list shall contain the truck identification number, mixer brand, mixer age, and mixer condition.

When truck mixers are used, the mix uniformity testing shall be performed on 5 truck mixers for each project. The truck mixers selected for testing shall be representative of the different mixer brands, ages, and conditions of the mixers on the list and approved by the Engineer. Mixer selection shall be completed before mix uniformity testing is started. Sampling for the mix uniformity tests from each of the 5 mixers shall be completed within the same work shift, unless otherwise approved in writing by the Engineer. The Contractor shall notify the Engineer, in writing, a minimum of 24 hours prior to performing the sampling for these tests. The letter of notification shall include the truck mixer information and a copy of the current American Concrete Institute (ACI) "Concrete Field Testing Technician, Grade 1" certification for each tester who will perform testing for the Contractor. The Contractor shall provide an adequate number of testers to successfully perform the testing with a minimum amount of impact to the Contractor's operations.

When concrete is completely mixed in stationary mixers, each mixer used for the project shall be tested one time.

Full compensation for the testing of mix uniformity as specified herein shall be considered as included in the contract price paid for the concrete work involved and no additional compensation will be allowed therefor.

Unless otherwise specified, a Type C accelerating chemical admixture conforming to the requirements in ASTM Designation: C 494 may be used in portland cement concrete for precast steam cured concrete members.

Section 90-1.01, "Description," of the Standard Specifications is amended to read:

#### **90-1.01 DESCRIPTION**

- Portland cement concrete shall be composed of cementitious material, fine aggregate, coarse aggregate, admixtures if used, and water, proportioned and mixed as specified in these specifications.
- Unless otherwise specified, cementitious material to be used in portland cement concrete shall conform to the provisions for cement and mineral admixtures in Section 90-2, "Materials," and shall be either: 1) "Type IP (MS) Modified" cement or 2) a combination of "Type II Modified" portland cement and mineral admixture.
- Concrete for each portion of the work shall comply with the provisions for the Class, cementitious material content in kilograms per cubic meter, 28-day compressive strength, minor concrete or commercial quality concrete, as shown on the plans or specified in these specifications or the special provisions.

- Class 1 concrete shall contain not less than 400 kg of cementitious material per cubic meter.
- Class 2 concrete shall contain not less than 350 kg of cementitious material per cubic meter.
- Class 3 concrete shall contain not less than 300 kg of cementitious material per cubic meter.
- Class 4 concrete shall contain not less than 250 kg of cementitious material per cubic meter.
- Minor concrete shall contain not less than 325 kg of cementitious material per cubic meter unless otherwise specified in these specifications or the special provisions.
- Unless otherwise designated on the plans or specified in these specifications or the special provisions, the amount of cementitious material used per cubic meter of concrete in structures or portions of structures shall conform to the following:

| Use   | Cementitious Material Content<br>(kg/m <sup>3</sup> ) |
|---|---|
| Concrete which is designated by compressive strength: |   |
| Deck slabs and slab spans of bridges                  | 400 min., 475 max.                                    |
| Roof sections of exposed top box culverts             | 400 min., 475 max.                                    |
| Other portions of structures                          | 350 min., 475 max.                                    |
| Concrete not designated by compressive strength:      |   |
| Deck slabs and slab spans of bridges                  | 400 min.  |
| Roof sections of exposed top box culverts             | 400 min.  |
| Prestressed members                                   | 400 min.  |
| Seal courses  | 400 min.  |
| Other portions of structures                          | 350 min.  |
| Concrete for precast members                          | 350 min., 550 max.                                    |

- Whenever the 28-day compressive strength shown on the plans is greater than 25 MPa, the concrete shall be considered to be designated by compressive strength. If the plans show a 28-day compressive strength which is 31 MPa or greater, an additional 7 days will be allowed to obtain the specified strength. The 28-day compressive strengths shown on the plans which are 25 MPa or less are shown for design information only and are not to be considered a requirement for acceptance of the concrete.
- Concrete designated by compressive strength shall be proportioned such that the concrete will conform to the strength shown on the plans or specified in the special provisions.
- The Contractor shall determine the mix proportions for all concrete except pavement concrete. The Engineer will determine the mix proportions for pavement concrete.
- Before using concrete for which the mix proportions have been determined by the Contractor, or in advance of revising those mix proportions, the Contractor shall submit in writing to the Engineer a copy of the mix design.
- Compliance with cementitious material content requirements will be verified in conformance with procedures described in California Test 518 for cement content. For testing purposes, mineral admixture shall be considered to be cement. Batch proportions shall be adjusted as necessary to produce concrete having the specified cementitious material content.
- If any concrete used in the work has a cementitious material content, consisting of cement, mineral admixture, or cement plus mineral admixture, which is less than the minimum required for the work, the concrete shall be removed. However, if the Engineer determines that the concrete is structurally adequate, the concrete may remain in place and the Contractor shall pay to the State \$0.55 for each kilogram of cement, mineral admixture, or cement plus mineral admixture which is less than the minimum required for the work. The Department may deduct the amount from moneys due, or that may become due, the Contractor under the contract. The deductions will not be made unless the difference between the contents required and those actually provided exceeds the batching tolerances permitted by Section 90-5, "Proportioning." No deductions for cementitious material content will be made based on the results of California Test 518.
- The requirements of the preceding paragraph shall not apply to minor concrete or commercial quality concrete.
- Concrete for which the mix proportions are determined either by the Contractor or the Engineer shall conform to the requirements of this Section 90.

The first paragraph in Section 90-2.01, "Portland Cement," of the Standard Specifications is amended to read:

#### **90-2.01 PORTLAND CEMENT**

- Unless otherwise specified, portland cement shall be either "Type IP (MS) Modified" cement or "Type II Modified" portland cement.
- "Type IP (MS) Modified" cement shall conform to the specifications for Type IP (MS) cement in ASTM Designation: C 595, and shall be comprised of an intimate mixture of Type II cement and not more than 25 percent of a

mineral admixture. The type and minimum amount of mineral admixture used in the manufacture of "Type IP (MS) Modified" cement shall be in conformance with the provisions in Section 90-4.08, "Required Use of Mineral Admixtures."

- "Type II Modified" portland cement shall conform to the requirements for Type II portland cement in ASTM Designation: C 150.

- In addition, "Type IP (MS) Modified" cement and "Type II Modified" portland cement shall conform to the following requirements:

- A. The cement shall not contain more than 0.60 percent by mass of alkalis, calculated as the percentage of Na<sub>2</sub>O plus 0.658 times the percentage of K<sub>2</sub>O, when determined by either direct intensity flame photometry or by the atomic absorption method. The instrument and procedure used shall be qualified as to precision and accuracy in conformance with the requirements in ASTM Designation: C 114.
- B. The autoclave expansion shall not exceed 0.50 percent.
- C. Mortar, containing the cement to be used and Ottawa sand, when tested in conformance with California Test 527, shall not expand in water more than 0.010 percent and shall not contract in air more than 0.048 percent except that when cement is to be used for precast prestressed concrete piling, precast prestressed concrete members or steam cured concrete products, the mortar shall not contract in air more than 0.053 percent.

The second paragraph in Section 90-2.01, "Portland Cement," of the Standard Specifications is amended to read:

- Type III and Type V portland cements shall conform to the requirements in ASTM Designation: C 150, and the additional requirements listed above for Type II Modified portland cement, except that when tested in conformance with California Test 527, mortar containing Type III portland cement shall not contract in air more than 0.075 percent.

The third paragraph in Section 90-2.01, "Portland Cement," of the Standard Specifications is deleted.

The twelfth paragraph in Section 90-2.02, "Aggregates," of the Standard Specifications is deleted.

The first paragraph in Section 90-2.03, "Water," of the Standard Specifications is amended to read:

#### **90-2.03 WATER**

- In conventionally reinforced concrete work, the water for curing, for washing aggregates, and for mixing shall be free from oil and shall not contain more than 1,000 parts per million of chlorides as Cl, nor more than 1,300 parts per million of sulfates as SO<sub>4</sub>. In prestressed concrete work, the water for curing, for washing aggregates, and for mixing shall be free from oil and shall not contain more than 650 parts per million of chlorides as Cl, nor more than 1,300 parts per million of sulfates as SO<sub>4</sub>. In no case shall the water contain an amount of impurities that will cause either: 1) a change in the setting time of cement of more than 25 percent when tested in conformance with the requirements in ASTM Designation: C 191 or ASTM Designation: C 266 or 2) a reduction in the compressive strength of mortar at 14 days of more than 5 percent, when tested in conformance with the requirements in ASTM Designation: C 109, when compared to the results obtained with distilled water or deionized water, tested in conformance with the requirements in ASTM Designation: C 109.

The following section is added to Section 90-2, "Materials," of the Standard Specifications:

#### **90-2.04 ADMIXTURE MATERIALS**

- Admixture materials shall conform to the requirements in the following ASTM Designations:

- A. Chemical Admixtures—ASTM Designation: C 494.
- B. Air-entraining Admixtures—ASTM Designation: C 260.
- C. Calcium Chloride—ASTM Designation: D 98.
- D. Mineral Admixtures—Coal fly ash, raw or calcined natural pozzolan as specified in ASTM Designation: C 618. Silica fume conforming to the requirements in ASTM Designation: C 1240, with reduction of mortar expansion of 80 percent, minimum, using the cement from the proposed mix design.

- Mineral admixtures shall be used in conformance with the provisions in Section 90-4.08, "Required Use of Mineral Admixtures."

The first paragraph in Section 90-3.03, "Fine Aggregate Grading," is amended to read:

Fine aggregate shall be graded within the following limits:

| Sieve Sizes        | Percentage Passing |                     |
|--------------------|--------------------|---------------------|
|                    | Operating Range    | Contract Compliance |
| 9.5-mm             | 100                | 100                 |
| 4.75-mm            | 95-100             | 93-100              |
| 2.36-mm            | 65-95              | 61-99               |
| 1.18-mm            | $X \pm 10$         | $X \pm 13$          |
| 600- $\mu\text{m}$ | $X \pm 9$          | $X \pm 12$          |
| 300- $\mu\text{m}$ | $X \pm 6$          | $X \pm 9$           |
| 150- $\mu\text{m}$ | 2-12               | 1-15                |
| 75- $\mu\text{m}$  | 0-8                | 0-10                |

Section 90-4.02, "Materials," of the Standard Specifications is amended to read:

#### **90-4.02 MATERIALS**

- Admixture materials shall conform to the provisions in Section 90-2.04, "Admixture Materials."

Section 90-4.05, "Optional Use of Chemical Admixtures," of the Standard Specifications is amended to read:

#### **90-4.05 OPTIONAL USE OF CHEMICAL ADMIXTURES**

- The Contractor will be permitted to use Type A or F, water-reducing; Type B, retarding; or Type D or G, water-reducing and retarding admixtures as described in ASTM Designation: C 494 to conserve cementitious material or to facilitate concrete construction application subject to the following conditions:

- When a water-reducing admixture or a water-reducing and retarding admixture is used, the cementitious material content specified or ordered may be reduced by a maximum of 5 percent by mass except that the resultant cementitious material content shall be not less than 300 kilograms per cubic meter.
- When a reduction in cementitious material content is made, the dosage of admixture used shall be the dosage used in determining approval of the admixture.

Section 90-4.07, "Optional Use of Air-entraining Admixtures," of the Standard Specifications is amended to read:

#### **90-4.07 OPTIONAL USE OF AIR-ENTRAINING ADMIXTURES**

- When air-entrainment has not been specified or ordered by the Engineer, the Contractor will be permitted to use an air-entraining admixture to facilitate the use of any construction procedure or equipment provided that the average air content, as determined by California Test 504, of 3 successive tests does not exceed 4 percent and no single test value exceeds 5.5 percent. If the Contractor elects to use an air-entraining admixture in concrete for pavement, the Contractor shall so indicate at the time the Contractor designates the source of aggregate as provided in Section 40-1.015, "Cement Content."

Section 90-4.08, "Required Use of Mineral Admixtures," of the Standard Specifications is amended to read:

#### **90-4.08 REQUIRED USE OF MINERAL ADMIXTURES**

- Unless otherwise specified, mineral admixture shall be combined with cement to make cementitious material for use in portland cement concrete.
- The calcium oxide content of mineral admixtures shall not exceed 10 percent and the available alkali, as sodium oxide equivalent, shall not exceed 1.5 percent when determined in conformance with the requirements in ASTM Designation: C618.
- The amounts of cement and mineral admixture used in cementitious material for portland cement concrete shall be sufficient to satisfy the minimum cementitious material content requirements specified in Section 90-1.01, "Description," or Section 90-4.05, "Optional Use of Chemical Admixtures," and shall conform to the following:

- The minimum amount of cement shall not be less than 75 percent by mass of the specified minimum cementitious material content.
- The minimum amount of mineral admixture to be combined with cement shall be determined using one of the following criteria:
  - When the calcium oxide content of a mineral admixture, as determined in conformance with the requirements in ASTM Designation: C618 and the provisions in Section 90-2.04, "Admixture Materials," is equal to or less than

- 2 percent by mass, the amount of mineral admixture shall not be less than 15 percent by mass of the total amount of cementitious material to be used in the mix.
2. When the calcium oxide content of a mineral admixture, as determined in conformance with the requirements in ASTM Designation: C618 and the provisions in Section 90-2.04, "Admixture Materials," is greater than 2 percent, the amount of mineral admixture shall not be less than 25 percent by mass of the total amount of cementitious material to be used in the mix.
  3. When a mineral admixture is used, which conforms to the provisions for silica fume in Section 90-2.04, "Admixture Materials," the amount of mineral admixture shall not be less than 10 percent by mass of the total amount of cementitious material to be used in the mix.
- C. If more than the required amount of cementitious material is used, the additional cementitious material in the mix may be either cement, a mineral admixture conforming to the provisions in Section 90-2.04, "Admixture Materials," or a combination of both; however, the maximum total amount of mineral admixture shall not exceed 35 percent by mass of the total amount of cementitious material to be used in the mix. Where Section 90-1.01, "Description," specifies a maximum cementitious content in kilograms per cubic meter, the total mass of cement and mineral admixture per cubic meter shall not exceed the specified maximum cementitious material content.

Section 90-4.09, "Optional Use of Mineral Admixtures," of the Standard Specifications is deleted.

Section 90-4.11, "Storage, Proportioning, and Dispensing of Mineral Admixtures," of the Standard Specifications is amended to read:

#### **90-4.11 STORAGE, PROPORTIONING, AND DISPENSING OF MINERAL ADMIXTURES**

- Mineral admixtures shall be protected from exposure to moisture until used. Sacked material shall be piled to permit access for tally, inspection, and identification for each shipment.
- Adequate facilities shall be provided to assure that mineral admixtures meeting the specified requirements are kept separate from other mineral admixtures in order to prevent any but the specified mineral admixtures from entering the work. Safe and suitable facilities for sampling mineral admixtures shall be provided at the weigh hopper or in the feed line immediately in advance of the hopper.
- Mineral admixtures shall be incorporated into concrete using equipment conforming to the requirements for cement weigh hoppers, and charging and discharging mechanisms in ASTM Designation: C 94, in Section 90-5.03, "Proportioning," and in this Section 90-4.11.
- When interlocks are required for cement and mineral admixture charging mechanisms by Section 90-5.03A, "Proportioning for Pavement," and cement and mineral admixtures are weighed cumulatively, their charging mechanisms shall be interlocked to prevent the introduction of mineral admixture until the mass of cement in the cement weigh hopper is within the tolerances specified in Section 90-5.02, "Proportioning Devices."
- Mineral admixture used in concrete for exposed surfaces of like elements of a structure shall be from the same source and of the same percentage.

Section 90-5.02, "Proportioning Devices," of the Standard Specifications is amended to read:

#### **90-5.02 PROPORTIONING DEVICES**

- Weighing, measuring or metering devices used for proportioning materials shall conform to the provisions in Section 9-1.01, "Measurement of Quantities," and this Section 90-5.02. In addition, automatic weighing systems used shall comply with the provisions for automatic proportioning devices in Section 90-5.03A, "Proportioning for Pavement." These automatic devices shall be automatic to the extent that the only manual operation required for proportioning the aggregates, cement, and mineral admixture for one batch of concrete is a single operation of a switch or starter.
- Proportioning devices shall be tested at the expense of the Contractor as frequently as the Engineer may deem necessary to insure their accuracy.
- Weighing equipment shall be insulated against vibration or movement of other operating equipment in the plant. When the plant is in operation, the mass of each batch of material shall not vary from the mass designated by the Engineer by more than the tolerances specified herein.
- Equipment for cumulative weighing of aggregate shall have a zero tolerance of  $\pm 0.5$  percent of the designated total batch mass of the aggregate. For systems with individual weigh hoppers for the various sizes of aggregate, the zero tolerance shall be  $\pm 0.5$  percent of the individual batch mass designated for each size of aggregate. Equipment for cumulative weighing of cement and mineral admixtures shall have a zero tolerance of  $\pm 0.5$  percent of the designated total batch mass of the cement and mineral admixture. Equipment for weighing cement or mineral admixture separately shall have a zero tolerance of  $\pm 0.5$  percent of their designated individual batch masses. Equipment for measuring water shall have a zero tolerance of  $\pm 0.5$  percent of its designated mass or volume.

- The mass indicated for a batch of material shall not vary from the preselected scale setting by more than the following:

- A. Aggregate weighed cumulatively shall be within 1.0 percent of the designated total batch mass of the aggregate. Aggregates weighed individually shall be within 1.5 percent of their respective designated batch masses.
- B. Cement shall be within 1.0 percent of its designated batch mass. When weighed individually, mineral admixture shall be within 1.0 percent of its designated batch mass. When mineral admixture and cement are permitted to be weighed cumulatively, cement shall be weighed first to within 1.0 percent of its designated batch mass, and the total for cement and mineral admixture shall be within 1.0 percent of the sum of their designated batch masses.
- C. Water shall be within 1.5 percent of its designated mass or volume.

- Each scale graduation shall be approximately 0.001 of the total capacity of the scale. The capacity of scales for weighing cement, mineral admixture, or cement plus mineral admixture and aggregates shall not exceed that of commercially available scales having single graduations indicating a mass not exceeding the maximum permissible mass variation above, except that no scale shall be required having a capacity of less than 500 kg, with 0.5 kg graduations.

Section 90-5.03, "Proportioning," excluding Section 90-5.03A, "Proportioning for Pavement," of the Standard Specifications is amended to read:

### **90-5.03 PROPORTIONING**

- Proportioning shall consist of dividing the aggregates into the specified sizes, each stored in a separate bin, and combining them with cement, mineral admixture, and water as provided in these specifications. Aggregates shall be proportioned by mass.

- At the time of batching, aggregates shall have been dried or drained sufficiently to result in a stable moisture content such that no visible separation of water from aggregate will take place during transportation from the proportioning plant to the point of mixing. In no event shall the free moisture content of the fine aggregate at the time of batching exceed 8 percent of its saturated, surface-dry mass.

- Should separate supplies of aggregate material of the same size group, but of different moisture content or specific gravity or surface characteristics affecting workability, be available at the proportioning plant, withdrawals shall be made from one supply exclusively and the materials therein completely exhausted before starting upon another.

- Bulk "Type IP (MS) Modified" cement that conforms to the provisions in Section 90-2.01, "Portland Cement," shall be weighed in an individual hopper and shall be kept separate from the aggregates until the ingredients are released for discharge into the mixer.

- Bulk cement to be blended with mineral admixture for use in portland cement concrete for pavement and structures may be weighed in separate, individual weigh hoppers or may be weighed in the same weigh hopper with mineral admixture and shall be kept separate from the aggregates until the ingredients are released for discharge into the mixer. If the cement and mineral admixture are weighed cumulatively, the cement shall be weighed first.

- When cement and mineral admixtures are weighed in separate weigh hoppers, the weigh systems for the proportioning of the aggregate, the cement, and the mineral admixture shall be individual and distinct from other weigh systems. Each weigh system shall be equipped with a hopper, a lever system, and an indicator to constitute an individual and independent material weighing device. The cement and the mineral admixture shall be discharged into the mixer simultaneously with the aggregate.

- The scale and weigh hopper for bulk weighing cement, mineral admixture, and cement plus mineral admixture shall be separate and distinct from the aggregate weighing equipment.

- When the source of an aggregate is changed for concrete structures, the Contractor shall adjust the mix proportions and submit in writing to the Engineer a copy of the mix design before using such aggregates. When the source of an aggregate is changed for other concrete, the Engineer shall be allowed sufficient time to adjust the mix and such aggregates shall not be used until necessary adjustments are made.

- For batches with a volume of one cubic meter or more, the batching equipment shall conform to one of the following combinations:

- A. Separate boxes and separate scale and indicator for weighing each size of aggregate.
- B. Single box and scale indicator for all aggregates.
- C. Single box or separate boxes and automatic weighing mechanism for all aggregates.

- In order to check the accuracy of batch masses, the gross mass and tare mass of batch trucks, truck mixers, truck agitators, and non-agitating hauling equipment shall be determined when ordered by the Engineer. The equipment shall be weighed at the Contractor's expense on scales designated by the Engineer.

Section 90-5.03A, "Proportioning for Pavement," of the Standard Specifications is amended to read:

**90-5.03A PROPORTIONING FOR PAVEMENT**

- Aggregates and bulk cement, mineral admixture, and cement plus mineral admixture for use in pavement shall be proportioned by mass by means of automatic proportioning devices of approved type conforming to the provisions in this Section 90-5.03A.
- The Contractor shall install and maintain in operating condition an electrically actuated moisture meter that will indicate, on a readily visible scale, changes in the moisture content of the fine aggregate as it is batched within a sensitivity of 0.5 percent by mass of the fine aggregate.
- The batching of cement, mineral admixture, or cement plus mineral admixture and aggregate shall be interlocked so that a new batch cannot be started until all weigh hoppers are empty, the proportioning devices are within zero tolerance, and the discharge gates are closed. The interlock shall permit no part of the batch to be discharged until all aggregate hoppers and the cement and mineral admixture hoppers or the cement plus mineral admixture hopper are charged with masses which are within the tolerances specified in Section 90-5.02, "Proportioning Devices."
- The discharge gate on the cement and mineral admixture hoppers or the cement plus mineral admixture hopper shall be designed to permit regulating the flow of cement, mineral admixture or cement plus mineral admixture into the aggregate as directed by the Engineer.
- When separate weigh boxes are used for each size of aggregate, the discharge gates shall permit regulating the flow of each size of aggregate as directed by the Engineer.
- Material discharged from the several bins shall be controlled by gates or by mechanical conveyors. The means of withdrawal from the several bins, and of discharge from the weigh box, shall be interlocked so that not more than one bin can discharge at a time, and that the weigh box cannot be tripped until the required quantity from each of the several bins has been deposited therein. Should a separate weigh box be used for each size of aggregate, all may be operated and discharged simultaneously.
- When the discharge from the several bins is controlled by gates, each gate shall be actuated automatically so that the required mass is discharged into the weigh box, after which the gate shall automatically close and lock.
- The automatic weighing system shall be designed so that all proportions required may be set on the weighing controller at the same time.

The third paragraph in Section 90-6.01, "General," of the Standard Specifications is amended to read:

- Concrete shall be homogeneous and thoroughly mixed. There shall be no lumps or evidence of undispersed cement, mineral admixture, or cement plus mineral admixture.

The third and fourth paragraphs in Section 90-6.02, "Machine Mixing," of the Standard Specifications are amended to read:

- The batch shall be so charged into the mixer that some water will enter in advance of cementitious materials and aggregates. All water shall be in the drum by the end of the first one-fourth of the specified mixing time.
- Cementitious materials shall be batched and charged into the mixer by means that will not result either in loss of cementitious materials due to the effect of wind, or in accumulation of cementitious materials on surfaces of conveyors or hoppers, or in other conditions which reduce or vary the required quantity of cementitious material in the concrete mixture.

The sixth paragraph in Section 90-6.02, "Machine Mixing," of the Standard Specifications is amended to read:

- The total elapsed time between the intermingling of damp aggregates and all cementitious materials and the start of mixing shall not exceed 30 minutes.

The seventh through tenth paragraphs in Section 90-6.03, "Transporting Mixed Concrete," of the Standard Specifications are amended to read:

- When a truck mixer or agitator is used for transporting concrete to the delivery point, discharge shall be completed within 1.5 hours, or before 250 revolutions of the drum or blades, whichever comes first, after the introduction of the cement to the aggregates. Under conditions contributing to quick stiffening of the concrete, or when the temperature of the concrete is 30°C, or above, a time less than 1.5 hours may be required.
- When non-agitating hauling equipment is used for transporting concrete to the delivery point, discharge shall be completed within one hour after the addition of the cement to the aggregates. Under conditions contributing to quick



stiffening of the concrete, or when the temperature of the concrete is 30°C, or above, the time between the introduction of cement to the aggregates and discharge shall not exceed 45 minutes.

- Each load of concrete delivered at the job site shall be accompanied by a weight certificate showing the mix identification number, non-repeating load number, date and time at which the materials were batched, the total amount of water added to the load and for transit-mixed concrete, the reading of the revolution counter at the time the truck mixer is charged with cement. This weight certificate shall also show the actual scale masses (kilograms) for the ingredients batched. Theoretical or target batch masses shall not be used as a substitute for actual scale masses.

- Weight certificates shall be provided in printed form, or if approved by the Engineer, the data may be submitted in electronic media. Electronic media shall be presented in a tab-delimited format on 90 mm diskette with a capacity of at least 1.4 megabytes. Captured data, for the ingredients represented by each batch shall be LFCR (one line, separate record) with allowances for sufficient fields to satisfy the amount of data required by these specifications.

- The Contractor may furnish a weight certificate that is accompanied by a separate certificate which lists the actual batch masses or measurements for a load of concrete provided that both certificates are 1) imprinted with the same non-repeating load number that is unique to the contract and 2) delivered to the job site with the load.

- Weight certificates furnished by the Contractor shall conform to the provisions in Section 9-1.01, "Measurement of Quantities," of the Standard Specifications.

Section 90-6.05, "Hand-Mixing," of the Standard Specifications is amended to read:

#### **90-6.05 HAND-MIXING**

- Hand-mixed concrete shall be made in batches not more than one-fourth cubic meter and shall be mixed on a watertight, level platform. The proper amount of coarse aggregate shall be measured in measuring boxes and spread on the platform and the fine aggregate shall be spread on this layer, the 2 layers being not more than 0.3 meters in total depth. On this mixture shall be spread the dry cement and mineral admixture and the whole mass turned no fewer than 2 times dry; then sufficient clean water shall be added, evenly distributed, and the whole mass again turned no fewer than 3 times, not including placing in the carriers or forms.

The table in the first paragraph in Section 90-6.06, "Amount of Water and Penetration," of the Standard Specifications is replaced with the following table:

| Type of Work                       | Nominal Penetration<br>(mm) | Maximum Penetration<br>(mm) |
|------------------------------------|-----------------------------|-----------------------------|
| Concrete pavement                  | 0-25                        | 40                          |
| Non-reinforced concrete facilities | 0-35                        | 50                          |
| Reinforced concrete structures:    |                             |                             |
| Sections over 300 mm thick         | 0-35                        | 65                          |
| Sections 300 mm thick or less      | 0-50                        | 75                          |
| Concrete placed under water        | 75-100                      | 115                         |
| Cast-in-place concrete piles       | 65-90                       | 100                         |

The first paragraph following the table of penetration ranges in Section 90-6.06, "Amount of Water and Penetration," of the Standard Specifications is amended to read:

- The amount of free water used in concrete shall not exceed 183 kg/m<sup>3</sup>, plus 20 kg for each required 100 kg of cementitious material in excess of 325 kg/m<sup>3</sup>.

The fourth paragraph in Section 90-6.06, "Amount of Water and Penetration," of the Standard Specifications is amended to read:

- Where there are adverse or difficult conditions which affect the placing of concrete, the above specified penetration and free water content limitations may be exceeded providing the Contractor is granted permission by the Engineer in writing to increase the cementitious material content per cubic meter of concrete. The increase in water and cementitious material shall be at a ratio not to exceed 30 kg of water per added 100 kg of cementitious material per cubic meter. The cost of additional cementitious material and water added under these conditions shall be at the Contractor's expense and no additional compensation will be allowed therefor.

Section 90-9.01, "General," of the Standard Specifications is amended to read:

### 90-9.01 GENERAL

- Concrete compressive strength requirements consist of a minimum strength which must be attained before various loads or stresses are applied to the concrete and, for concrete designated by strength, a minimum strength at the age of 28 days or at the age otherwise allowed in Section 90-1.01, "Description." The various strengths required are specified in these specifications or are shown on the plans.

- The compressive strength of concrete will be determined from test cylinders which have been fabricated from concrete sampled in conformance with California Test 539. Test cylinders will be molded and initial field cured in conformance with California Test 540. Test cylinders will be cured and tested after receipt at the testing laboratory in conformance with California Test 521. A strength test shall consist of the average strength of 2 cylinders fabricated from material taken from a single load of concrete, except that, if any cylinder should show evidence of improper sampling, molding, or testing, that cylinder shall be discarded and the strength test shall consist of the strength of the remaining cylinder.

- When concrete compressive strength is specified as a prerequisite to applying loads or stresses to a concrete structure or member, test cylinders for other than steam cured concrete will be cured in conformance with Method 1 of California Test 540. The compressive strength of concrete determined for these purposes will be evaluated on the basis of individual tests.

- When concrete is designated by 28-day compressive strength rather than by cementitious material content, the concrete strength to be used as a basis for acceptance of other than steam cured concrete will be determined from cylinders cured in conformance with Method 1 of California Test 540. If the result of a single compressive strength test at the maximum age specified or allowed is below the specified strength but is 95 percent or more of the specified strength, the Contractor shall, at the Contractor's expense, make corrective changes, subject to approval by the Engineer, in the mix proportions or in the concrete fabrication procedures, before placing additional concrete, and shall pay to the State \$14 for each in-place cubic meter of concrete represented by the deficient test. If the result of a single compressive strength test at the maximum age specified or allowed is below 95 percent of the specified strength, but is 85 percent or more of the specified strength, the Contractor shall make the corrective changes specified above, and shall pay to the State \$20 for each in place cubic meter of concrete represented by the deficient test. In addition, such corrective changes shall be made when the compressive strength of concrete tested at 7 days indicates, in the judgment of the Engineer, that the concrete will not attain the required compressive strength at the maximum age specified or allowed. Concrete represented by a single test which indicates a compressive strength of less than 85 percent of the specified 28-day compressive strength will be rejected in conformance with the provisions in Section 6-1.04, "Defective Materials."

- If the test result indicates that the compressive strength at the maximum curing age specified or allowed is below the specified strength, but 85 percent or more of the specified strength, payments to the State as required above shall be made, unless the Contractor, at the Contractor's expense, obtains and submits evidence acceptable to the Engineer that the strength of the concrete placed in the work meets or exceeds the specified 28-day compressive strength. If the test result indicates a compressive strength at the maximum curing age specified or allowed below 85 percent, the concrete represented by that test will be rejected, unless the Contractor, at the Contractor's expense, obtains and submits evidence acceptable to the Engineer that the strength and quality of the concrete placed in the work are acceptable. If the evidence consists of tests made on cores taken from the work, the cores shall be obtained and tested in conformance with the requirements in ASTM Designation: C 42.

- No single compressive strength test shall represent more than 250 cubic meters.

- When a precast concrete member is steam cured, the compressive strength of the concrete will be determined from test cylinders which have been handled and stored in conformance with Method 3 of California Test 540. The compressive strength of steam cured concrete will be evaluated on the basis of individual tests representing specific portions of production. When the concrete is designated by 28-day compressive strength rather than by cementitious material content, the concrete shall be considered to be acceptable whenever its compressive strength reaches the specified 28-day compressive strength provided that strength is reached in not more than the maximum number of days specified or allowed after the member is cast.

- If concrete is specified by compressive strength, then materials, mix proportions, mixing equipment, and procedures proposed for use shall be prequalified prior to placement of the concrete. Prequalification shall be accomplished by the submission of acceptable certified test data or trial batch reports by the Contractor. Prequalification data shall be based on the use of materials, mix proportions, mixing equipment, procedures, and size of batch proposed for use in the work.

- Certified test data, in order to be acceptable, must indicate that not less than 90 percent of at least 20 consecutive tests exceed the specified strength at the maximum number of cure days specified or allowed, and none of those tests are less than 95 percent of specified strength. Strength tests included in the data shall be the most recent tests made on concrete of the proposed mix design and all shall have been made within one year of the proposed use of the concrete.

- Trial batch test reports, in order to be acceptable, must indicate that the average compressive strength of 5 consecutive concrete cylinders, taken from a single batch, at not more than 28 days (or the maximum age allowed) after molding shall be at least 4 MPa greater than the specified 28-day compressive strength, and no individual cylinder shall have

a strength less than the specified strength at the maximum age specified or allowed. Data contained in the report shall be from trial batches which were produced within one year of the proposed use of specified strength concrete in the project. Whenever air-entrainment is required, the air content of trial batches shall be equal to or greater than the air content specified for the concrete without reduction due to tolerances.

- Tests shall be performed in conformance with either the appropriate California Test methods or the comparable ASTM test methods. Equipment employed in testing shall be in good condition and shall be properly calibrated. If the tests are performed during the life of the contract, the Engineer shall be notified sufficiently in advance of performing the tests in order to witness the test procedures.

- The certified test data and trial batch test reports shall include the following information:

- A. Date of mixing.
- B. Mixing equipment and procedures used.
- C. The size of batch in cubic meters and the mass, type and source of ingredients used.
- D. Penetration of the concrete.
- E. The air content of the concrete if an air-entraining admixture is used.
- F. The age at time of testing and strength of concrete cylinders tested.

- Certified test data and trial batch test reports shall be signed by an official of the firm which performed the tests.

- When approved by the Engineer, concrete from trial batches may be used in the work at locations where concrete of a lower quality is required and the concrete will be paid for as the type or class of concrete required at that location.

- After materials, mix proportions, mixing equipment, and procedures for concrete have been prequalified for use, additional prequalification by testing of trial batches will be required prior to making changes which, in the judgment of the Engineer, could result in a lowering of the strength of the concrete below that specified.

- The Contractor's attention is directed to the time required to test trial batches. The Contractor shall be responsible for production of trial batches at a sufficiently early date so that the progress of the work is not delayed.

- When precast concrete members are manufactured at the plant of an established manufacturer of precast concrete members, the mix proportions of the concrete shall be determined by the Contractor, and a trial batch and prequalification of the materials, mix proportions, mixing equipment, and procedures will not be required.

Section 90-10.02A, "Portland Cement," of the Standard Specifications is renamed "Cementitious Material" and is amended to read:

#### **90-10.02A CEMENTITIOUS MATERIAL**

- Cementitious material shall conform to the provisions in Section 90-1.01, "Description." Compressive strength requirements consist of a minimum strength which must be attained before various loads or stresses are applied to the concrete and, for concrete designated by strength, a minimum strength at the age of 28 days or at the age otherwise allowed in Section 90-1.01, "Description." The various strengths required are specified in these specifications or are shown on the plans.

The fifth paragraph in Section 90-10.02B, "Aggregate," of the Standard Specifications is deleted.

Section 90-10.03, "Production," of the Standard Specifications is amended to read:

#### **90-10.03 PRODUCTION**

- Cementitious material, water, aggregate, and admixtures shall be stored, proportioned, mixed, transported, and discharged in conformance with recognized standards of good practice, which will result in concrete that is thoroughly and uniformly mixed, which is suitable for the use intended, and which conforms to provisions specified herein. Recognized standards of good practice are outlined in various industry publications such as those issued by American Concrete Institute, AASHTO, or California Department of Transportation.

- The cementitious material content of minor concrete shall conform to the provisions in Section 90-1.01, "Description."

- The amount of water used shall result in a consistency of concrete conforming to the provisions in Section 90-6.06, "Amount of Water and Penetration." Additional mixing water shall not be incorporated into the concrete during hauling or after arrival at the delivery point, unless authorized by the Engineer.

- Discharge of ready-mixed concrete from the transporting vehicle shall be made while the concrete is still plastic and before stiffening occurs. An elapsed time of 1.5 hours (one hour in non-agitating hauling equipment), or more than 250 revolutions of the drum or blades, after the introduction of the cementitious material to the aggregates, or a temperature of concrete of more than 32°C will be considered as conditions contributing to the quick stiffening of concrete. The Contractor shall take whatever action is necessary to eliminate quick stiffening, except that the addition of water will not be permitted.

- The required mixing time in stationary mixers shall be not less than 50 seconds or more than 5 minutes.
- The minimum required revolutions at mixing speed for transit-mixed concrete shall be not less than that recommended by the mixer manufacturer, and shall be increased, if necessary, to produce thoroughly and uniformly mixed concrete.
- Each load of ready-mixed concrete shall be accompanied by a weight certificate which shall be delivered to the Engineer at the discharge location of the concrete, unless otherwise directed by the Engineer. The weight certificate shall be clearly marked with the date and time of day when the load left the batching plant and, if hauled in truck mixers or agitators, the time the mixing cycle started.
- A Certificate of Compliance conforming to the provisions in Section 6-1.07, "Certificates of Compliance," shall be furnished to the Engineer, prior to placing minor concrete from a source not previously used on the contract, stating that minor concrete to be furnished meets contract requirements, including minimum cementitious material content specified.

The third and fourth paragraphs in Section 90-11.02, "Payment," of the Standard Specifications are amended to read:

- Should the Engineer order the Contractor to incorporate admixtures into the concrete when their use is not required by these specifications or the special provisions, furnishing the admixtures and adding them to the concrete will be paid for as extra work as provided in Section 4-1.03D.
- Should the Contractor use admixtures in conformance with the provisions in Section 90-4.05, "Optional Use of Chemical Admixtures," or Section 90-4.07, "Optional Use of Air-entraining Admixtures," or should the Contractor request and obtain permission to use other admixtures for the Contractor's benefit, the Contractor shall furnish those admixtures and incorporate them in the concrete at the Contractor's expense and no additional compensation will be allowed therefor.

## **8-2.02 CEMENT AND WATER CONTENT**

The amount of free water used in concrete for deck slabs of bridges and structure approach slabs shall not exceed 195 kg/m<sup>3</sup>, plus 20 kg for each required 100 kg of cementitious material in excess of 400 kg/m<sup>3</sup>.

## **SECTION 8-3. WELDING**

### **8-3.01 WELDING ELECTRODES**

Flux core welding electrodes conforming to the requirements of AWS A5.20 E6XT-4 or E7XT-4 shall not be used to perform any type of welding for this project.

### **8-3.02 WELDING QUALITY CONTROL**

Welding quality control shall conform to the requirements in the AWS welding codes, the Standard Specifications, and these special provisions.

Welding quality control shall apply when any work is welded in conformance with the provisions in Section 49, "Piling," Section 52, "Reinforcement," Section 55, "Steel Structures," Section 56-1, "Overhead Sign Structures," Section 75-1.035, "Bridge Joint Restrainer Units," or Section 86-2.04, "Standards, Steel Pedestals and Posts," of the Standard Specifications.

Wherever reference is made to the following AWS welding codes in the Standard Specifications, on the plans or in these special provisions, the year of adoption for these codes shall be as listed:

| AWS Code           | Year of Adoption |
|--------------------|------------------|
| D1.1               | 1998             |
| D1.4               | 1992             |
| D1.5               | 1995             |
| D1.5 (metric only) | 1996             |

All requirements of the AWS welding codes shall apply unless specified otherwise in the Standard Specifications, on the plans or in these special provisions. Wherever the abbreviation AWS is used, it shall be equivalent to the abbreviations ANSI/AWS or ANSI/AASHTO/AWS.

The welding of all fracture critical members (FCMs) shall conform to the provisions specified in the Fracture Control Plan (FCP) and herein.

The Contractor shall designate in writing a welding Quality Control Manager (QCM). The QCM shall be responsible directly to the Contractor for the quality of welding, including materials and workmanship, performed by the Contractor and all subcontractors.

The QCM shall be the sole individual responsible to the Contractor for submitting, receiving, and approving all correspondence, required submittals, and reports to and from the Engineer.

The QCM shall not be employed or compensated by any subcontractor, or by other persons or entities hired by subcontractors, who will provide other services or materials for the project. The QCM may be an employee of the Contractor.

Welding inspection personnel or nondestructive testing (NDT) firms to be used in the work shall not be employed or compensated by any subcontractor, or by other persons or entities hired by subcontractors, who will provide other services or materials for the project, except for the following conditions:

- A. The welding is performed at a permanent fabrication facility which is certified under the AISC Quality Certification Program, Category Cbr, Major Steel Bridges.
- B. The welding is performed at a permanent fabrication facility which is certified under the AISC Quality Certification Program, Category Sbd, Conventional Steel Building Structures. This condition shall apply only for work welded in conformance with the provisions in Section 56-1, "Overhead Sign Structures" or Section 86-2.04, "Standards, Steel Pedestals and Posts," of the Standard Specifications.

For welding performed at such certified facilities, the inspection personnel or NDT firms may be employed or compensated by the fabrication facility performing the welding.

Prior to submitting the Welding Quality Control Plan (WQCP) required herein, a pre-welding meeting between the Engineer, Contractor and any welding subcontractors or entities hired by these subcontractors to be used in the work, shall be held to discuss the requirements for the WQCP.

Prior to performing any welding, the Contractor shall submit to the Engineer, in conformance with the provisions in Section 5-1.02, "Plans and Working Drawings," of the Standard Specifications, 3 copies of a separate WQCP for each item of work for which welding is to be performed. As a minimum, each WQCP shall include the following:

- A. The name of the welding firm and the NDT firm to be used;
- B. A manual prepared by the NDT firm that shall include equipment, testing procedures, code of safe practices, the Written Practice of the NDT firm, and the names, qualifications and documentation of certifications for all personnel to be used;
- C. The name of the QCM and the names, qualifications and documentation of certifications for all Quality Control (QC) Inspectors and Assistant Quality Control Inspectors to be used;
- D. An organizational chart showing all QC personnel and their assigned QC responsibilities;
- E. The methods and frequencies for performing all required quality control procedures, including QC inspection forms to be used, as required by the specifications including:
  - 1. all visual inspections;
  - 2. all NDT including radiographic geometry, penetrameter and shim selection, film quality, film processing, radiograph identification and marking system, and film interpretation and reports; and
  - 3. calibration procedures and calibration frequency for all NDT equipment;
- F. A system for the identification and tracking of all welds, NDT and any required repairs, and a procedure for the reinspection of any repaired welds. The system shall have provisions for 1) permanently identifying each weld and the person who performed the weld, 2) placing all identification and tracking information on each radiograph and 3) a method of reporting nonconforming welds to the Engineer;
- G. Standard procedures for performing noncritical repair welds. Noncritical repair welds are defined as welds to deposit additional weld beads or layers to compensate for insufficient weld size and to fill limited excavations that were performed to remove unacceptable edge or surface discontinuities, rollover or undercut. The depth of these excavations shall not exceed 65 percent of the specified weld size;
- H. The welding procedure specification (WPS), including documentation of all supporting Procedure Qualification Record (PQR) tests performed, and the name of the testing laboratory who performed the tests, to verify the acceptability of the WPS. The submitted WPS shall be within the allowable period of effectiveness;
- I. Documentation of all certifications for welders for each weld process and position that will be used. Certifications shall list the electrodes used, test position, base metal and thickness, tests performed, and the witnessing authority. All certifications shall be within the allowable period of effectiveness; and
- J. One copy each of all AWS welding codes and the FCP which are applicable to the welding to be performed. These codes and the FCP shall become the permanent property of the Department.
- K. Example forms to be used for Certificates of Compliance, daily production logs, and daily reports.

The Engineer shall have 10 working days to review the WQCP submittal after a complete plan has been received. No welding shall be performed until the WQCP is approved in writing by the Engineer. Should the Engineer fail to complete the review within this time allowance and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of the delay in reviewing the WQCP, the delay will be considered a right of way delay in conformance with the provisions in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

An amended WQCP or addendum shall be submitted to, and approved in writing by the Engineer, for any proposed revisions to the approved WQCP. An amended WQCP or addendum will be required for any revisions to the WQCP, including but not limited to a revised WPS, additional welders, changes in NDT firms or procedures, QC or NDT personnel, or updated systems for tracking and identifying welds. The Engineer shall have 3 working days to complete the review of the amended WQCP or addendum. Work that is affected by any of the proposed revisions shall not be performed until the amended WQCP or addendum has been approved. Should the Engineer fail to complete the review within this time allowance and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of the delay in reviewing the amended WQCP or addendum, the delay will be considered a right of way delay in conformance with the provisions in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

After final approval of the WQCP, amended WQCP, or addendum, the Contractor shall submit 7 copies to the Engineer of each of these approved documents.

It is expressly understood that the Engineer's approval of the Contractor's WQCP shall not relieve the Contractor of any responsibility under the contract for the successful completion of the work in conformity with the requirements of the plans and specifications. The Engineer's approval shall not constitute a waiver of any of the requirements of the plans and specifications nor relieve the Contractor of any obligation thereunder, and defective work, materials and equipment may be rejected notwithstanding approval of the WQCP.

A daily production log for welding shall be kept by the QCM for each day that welding is performed. The log shall clearly indicate the locations of all welding, and shall include the welders' names, amount of welding performed, any problems or deficiencies discovered, and any testing or repair work performed, at each location. The daily report from each Quality Control Inspector shall also be included in the log.

The following items shall be included in a Welding Report that is to be submitted to the Engineer within 7 days following the performance of any welding:

- A. Reports of all visual weld inspections and NDT;
- B. Radiographs and radiographic reports, and other required NDT reports;
- C. Documentation that the Contractor has evaluated all radiographs and other nondestructive tests, corrected all rejectable deficiencies, and all repaired welds have been reexamined by the required NDT and found acceptable; and
- D. Daily production log.

All radiographic envelopes shall have clearly written on the outside of the envelope the following information: name of the QCM, name of the nondestructive testing firm, name of the radiographer, date, contract number, complete part description, and all included weld numbers or a report number, as detailed in the WQCP. In addition, all innerleaves shall have clearly written on them the part description and all included weld numbers, as detailed in the WQCP.

All reports regarding NDT, including radiographs, shall be signed by both the NDT technician and the person that performed the review, and then submitted directly to the QCM for review and signature prior to submittal to the Engineer. Corresponding names shall be clearly printed or typewritten next to all signatures.

The Engineer will review the Welding Report to determine if the Contractor is in conformance with the WQCP. Except for steel piling, the Engineer shall be allowed 7 days to review the report and respond in writing after a complete Welding Report has been received. The review time for steel piling shall be as specified in "Piling" of these special provisions. Prior to receiving notification from the Engineer of the Contractor's conformance with the WQCP, the Contractor may encase in concrete or cover any welds for which a Welding Report has been submitted. However, should the Contractor elect to encase or cover those welds prior to receiving notification from the Engineer, it is expressly understood that the Contractor shall not be relieved of the responsibility for incorporating material in the work that conforms to the requirements of the plans and specifications. Any material not conforming to these requirements will be subject to rejection. Should the Contractor elect to wait to encase or cover any welds pending notification by the Engineer, and should the Engineer fail to complete the review and provide notification within this time allowance, and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of the delay in notification, the delay will be considered a right of way delay in conformance with the provisions in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

Sections 6.1.2 through 6.1.4.3 of AWS D 1.1, Sections 7.1.1 and 7.1.2 of AWS D 1.4, and Sections 6.1.1.1 through 6.1.3.3 of AWS D 1.5 are replaced with the following:

Quality Control (QC) shall be the responsibility of the Contractor. As a minimum, the Contractor shall perform inspection and testing prior to welding, during welding and after welding as specified in this section and additionally as necessary to ensure that materials and workmanship conform to the requirements of the contract documents.

The Quality Control (QC) Inspector shall be the duly designated person who performs inspection, testing, and quality matters for all welding.

Quality Assurance (QA) is the prerogative of the Engineer. The QA Inspector is the duly designated person who acts for and on behalf of the Engineer.

All QC Inspectors shall be responsible for quality control acceptance or rejection of materials and workmanship, and shall be currently certified as AWS Certified Welding Inspectors (CWI) in conformance with the requirements in AWS QC1, "Standard and Guide for Qualification of Welding Inspectors."

The QC Inspector may be assisted by an Assistant QC Inspector provided that this individual is currently certified as an AWS Certified Associate Welding Inspector (CAWI) in conformance with the requirements in AWS QC1, "Standard and Guide for Qualification of Welding Inspectors," or has equivalent qualifications. The QC Inspector shall monitor the Assistant QC Inspector's work, and shall be responsible for signing all reports.

When the term "Inspector" is used without further qualification, it shall refer to the QC Inspector.

Section 6.14.6, "Personnel Qualification," of AWS D 1.1, Section 7.7.6, "Personnel Qualification," of AWS D 1.4, and Section 6.1.3.4, "Personnel Qualification," of AWS D 1.5 are replaced with the following:

Personnel performing NDT shall be qualified in conformance with the requirements in the current edition of the American Society for Nondestructive Testing (ASNT) Recommended Practice No. SNT-TC-1A and the Written Practice of the NDT firm. The Written Practice of the NDT firm shall meet or exceed the requirements of the current edition of the ASNT Recommended Practice No. SNT-TC-1A. Only individuals who are 1) qualified for NDT Level II, or 2) Level III technicians who have been directly certified by the ASNT and are authorized to perform the work of Level II technicians, shall perform NDT, review the results, and prepare the written reports.

Section 6.5.4, "Scope of Examination," of AWS D 1.1 and Section 7.5.4 of AWS D 1.4 are replaced with the following:

The QC Inspector shall inspect and approve the joint preparation, assembly practice, welding techniques, and performance of each welder, welding operator, and tack welder to make certain that the applicable requirements of this code and the approved WPS are met.

Section 6.5.4 of AWS D 1.5 is replaced with the following:

The QC Inspector shall inspect and approve the joint preparation, assembly practice, welding techniques, and performance of each welder, welding operator, and tack welder to make certain that the applicable requirements of this code and the approved WPS are met. The QC Inspector shall examine the work to make certain that it meets the requirements of section 3 and 9.21. The size and contour of welds shall be measured using suitable gages. Visual inspection for cracks in welds and base metal, and for other discontinuities should be aided by strong light magnifiers, or such other devices as may be helpful. Acceptance criteria different from those specified in this code may be used when approved by the Engineer.

The Engineer shall have the authority to verify the qualifications or certifications of any welder, Quality Control Inspector, or NDT personnel to specified levels by retests or other means.

A sufficient number of QC Inspectors shall be provided to ensure continuous inspection when any welding is being performed. Continuous inspection, as a minimum, shall include (1) having QC Inspectors continually present on all shifts when any welding is being performed, or (2) having a QC Inspector within such close proximity of all welding operations that inspections by the QC Inspector of each operation, at each welding location, shall not lapse for a period exceeding 30 minutes.

Inspection and approval of the joint preparation, assembly practice, welding techniques, and performance of each welder, welding operator, and tack welder shall be documented by the QC Inspector on a daily basis for each day that welding is performed.

The QC Inspector shall provide reports to the QCM on a daily basis for each day that welding is performed.

Except for noncritical weld repairs, base metal repairs, or any other type of repairs not submitted in the WQCP, the Engineer shall be notified immediately in writing when any welding problems or deficiencies are discovered and also of the proposed repair procedures to correct them. The Engineer shall have 5 working days to review these procedures. No remedial work shall begin until the repair procedures are approved in writing by the Engineer. Should the Engineer fail to complete the review within this time allowance and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of the delay in reviewing the proposed repair procedures, the delay will be considered a right of way delay in conformance with the provisions in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

When joint details that are not prequalified by the applicable AWS codes are proposed for use in the work, all welders using these details shall perform a qualification test plate using the approved WPS variables and the joint detail to be used in production. The test plate shall be the maximum thickness to be used in production. The test plate shall be mechanically or

radiographically tested as directed by the Engineer. Mechanical and radiographic testing and acceptance criteria shall be as specified in the applicable AWS codes.

The period of effectiveness for a welder's or welding operator's qualification shall be a maximum of 3 years for the same weld process, welding position, and weld type. A valid qualification at the beginning of work on a contract will be acceptable for the entire period of the contract, as long as the welder's work remains satisfactory.

All qualification tests for welders, welding operators, and WPSs used in welding operations will be witnessed by the Engineer.

Section 6.6.5, "Nonspecified Nondestructive Testing Other Than Visual," of AWS D 1.1, Section 6.6.5 of AWS D 1.4 and Section 6.6.5 of AWS D 1.5 shall not apply.

For any welding, the Engineer may direct the Contractor to perform NDT that is in addition to the visual inspection or NDT specified in the AWS welding codes, in the Standard Specifications or in these special provisions. Additional NDT required by the Engineer, will be paid for as extra work as provided in Section 4-1.03D of the Standard Specifications. Should any welding deficiencies be discovered by this additional NDT, the cost of the testing will not be paid for as extra work and shall be at the Contractor's expense.

All required repair work to correct welding deficiencies, whether discovered by the required visual inspection or NDT, or by additional NDT directed by the Engineer, and any associated delays or expenses caused to the Contractor by performing these repairs, shall be at the Contractor's expense.

At the completion of all welding, the QCM shall sign and furnish to the Engineer, a Certificate of Compliance in conformance with the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications for each item of work for which welding was performed. The certificate shall state that all of the materials and workmanship incorporated in the work, and all required tests and inspections of this work, have been performed in conformance with the details shown on the plans and the provisions of the Standard Specifications and these special provisions.

Full compensation for conforming to of the requirements of this section shall be considered as included in the contract prices paid for the various items of work involved and no additional compensation will be allowed therefor.

## **SECTION 9. DESCRIPTION OF BRIDGE WORK**

The bridge work to be done consists, in general, of replacing the following structure as shown on the plans:

### **PUTAH CREEK BRIDGE**

Bridge No. 14-0014

A multiple span cast-in-place reinforced concrete box girder structure supported on pile foundations.

## **SECTION 10. CONSTRUCTION DETAILS**

### **SECTION 10-1. GENERAL**

#### **10-1.00 CONSTRUCTION PROJECT INFORMATION SIGNS**

Before any major physical construction work readily visible to highway users is started on this contract, the Contractor shall furnish and erect 2 Type 1 Construction Project Information signs at the locations designated by the Engineer.

The signs and overlays shall be of a type and material consistent with the estimated time of completion of the project and shall conform to the details shown on the plans.

The sign letters, border and the Department's construction logos shall conform to the colors (non-reflective) and details shown on the plans, and shall be on a white background (non-reflective). The colors blue and orange shall conform to PR Color Number 3 and Number 6, respectively, as specified in the Federal Highway Administration's Color Tolerance Chart.

The sign message to be used for fund types shall consist of the following, in the order shown:

|  |
|--|
| FEDERAL HIGHWAY TRUST FUNDS<br>STATE HIGHWAY FUNDS |
|--|

The sign message to be used for type of work shall consist of the following:

#### **BRIDGE CONSTRUCTION**

The sign message to be used for the Year of Completion of Project Construction will be furnished by the Engineer. The Contractor shall furnish and install the "Year" sign overlay within 10 working days of notification of the year date to be used.

The letter sizes to be used shall be as shown on the plans. The information shown on the signs shall be limited to that shown on the plans.



The signs shall be kept clean and in good repair by the Contractor.

Upon completion of the work, the signs shall be removed and disposed of outside the highway right of way in conformance with the provisions in Section 7-1.13 of the Standard Specifications.

Full compensation for furnishing, erecting, maintaining, and removing and disposing of the construction project information signs shall be considered as included in the contract lump sum price paid for construction area signs and no additional compensation will be allowed therefor.

#### **10-1.01 ORDER OF WORK**

Order of work shall conform to the provisions in Section 5-1.05, "Order of Work," of the Standard Specifications and these special provisions.

The Contractor shall notify the Engineer not less than 15 days before the anticipated start of work which reduces the width of the traveled way to less than 4.9 meters.

During Stage 1 construction no demolition of structure shall begin until the temporary signal and lighting is working in place.

Work within the waterway shall be limited to the period from May 1st to October 15th of any year. The Contractor shall construct a temporary creek diversion prior to working in the flowing stream. Any traffic control operation may involve support by the California Highway Patrol (CHP). The Contractor shall prepare written lane closure schedules in accordance with the requirements listed in "Lane Closure Requirements And Conditions", elsewhere in these special provisions. Any costs incurred by the CHP, as a result of late notification to the Engineer of cancellation of a lane closure will be deducted from any moneys due, or that may become due, the Contractor under the contract.

Temporary railing (Type K) and temporary crash cushions shall be secured in place prior to commencing work for which the temporary railing and crash cushions are required.

Attention is directed to "Maintaining Traffic" and "Temporary Pavement Delineation" of these special provisions and to the stage construction (Traffic Handling Plan) sheets of the plans.

Attention is directed to "Progress Schedule (Critical Path)" of these special provisions regarding the submittal of a general time-scaled logic diagram within 10 days after approval of the contract. The diagram shall be submitted prior to performing any work that may be affected by any proposed deviations to the construction staging of the project.

The work shall be performed in conformance with the stages of construction shown on the plans. Nonconflicting work in subsequent stages may proceed concurrently with work in preceding stages, provided satisfactory progress is maintained in the preceding stages of construction.

The first order of work shall be the removal of existing pavement delineation as directed by the Engineer. Pavement delineation removal shall be coordinated with new delineation so that lane lines are provided at all times on traveled ways open to public traffic.

Before obliterating any pavement delineation that is to be replaced on the same alignment and location, as determined by the Engineer, the pavement delineation shall be referenced by the Contractor, with a sufficient number of control points to reestablish the alignment and location of the new pavement delineation. The references shall include the limits or changes in striping pattern, including one- and 2-way barrier lines, limit lines, crosswalks and other pavement markings. Full compensation for referencing pavement delineation shall be considered as included in the contract prices paid for new pavement delineation and no additional compensation will be allowed therefor.

At the end of each working day if a difference in excess of 0.046-meter exists between the elevation of the existing pavement and the elevation of excavations within 1.5 m left and 2.4 m right of the traveled way that is not separated from public traffic by temporary railing (Type K), material shall be placed and compacted against the vertical cuts adjacent to the traveled way. During excavation operations, native material may be used for this purpose; however, once placing of the structural section commences, structural material shall be used. The material shall be placed to the level of the elevation of the top of existing pavement and tapered at a slope of 1:4 (vertical horizontal) or flatter to the bottom of the excavation. Treated base shall not be used for the taper. Full compensation for placing the material on a 1:4 slope, regardless of the number of times the material is required, and subsequent removing or reshaping of the material to the lines and grades shown on the plans shall be considered as included in the contract price paid for the materials involved and no additional compensation will be allowed therefor. No payment will be made for material placed in excess of that required for the structural section.

At those locations exposed to public traffic where guard railings or barriers are to be constructed, or removed and replaced, the Contractor shall schedule operations so that at the end of each working day there shall be no post holes open nor shall there be any railing or barrier posts installed without the blocks and rail elements assembled and mounted thereon.

Not less than 60 days prior to applying seeds, the Contractor shall furnish the Engineer a statement from the vendor that the order for the seed required for this contract has been received and accepted by the vendor. The statement from the vendor shall include the names and quantity of seed ordered and the anticipated date of delivery.

#### **10-1.02 WATER POLLUTION CONTROL**

Water pollution control work shall conform to the provisions in Section 7-1.01G, "Water Pollution," of the Standard Specifications and these special provisions.

Water pollution control work shall conform to the requirements in the Construction Contractor's Guide and Specifications of the Caltrans Storm Water Quality Handbooks, dated April 1997, and addenda thereto issued up to and including the date of advertisement of the project, hereafter referred to as the "Handbook." Copies of the Handbook may be obtained from the Department of Transportation, Material Operations Branch, Publication Distribution Unit, 1900 Royal Oaks Drive, Sacramento, California 95815, Telephone: (916) 445-3520.

Copies of the Handbook are also available for review at the Northern Region Construction Office at 379-A Colusa Highway, Yuba City, California 95991.

The Contractor shall know and fully comply with the applicable provisions of the Handbook and Federal, State, and local regulations that govern the Contractor's operations and storm water discharges from both the project site and areas of disturbance outside the project limits during construction.

Unless arrangements for disturbance of areas outside the project limits are made by the Department and made part of the contract, it is expressly agreed that the Department assumes no responsibility whatsoever to the Contractor or property owner with respect to any arrangements made between the Contractor and property owner to allow disturbance of areas outside the project limits.

The Contractor shall be responsible for the costs and for liabilities imposed by law as a result of the Contractor's failure to comply with the requirements set forth in this section "Water Pollution Control" including, but not limited to, compliance with the applicable provisions of the Handbook and Federal, State, and local regulations. For the purposes of this paragraph, costs and liabilities include, but are not limited to, fines, penalties, and damages whether assessed against the State or the Contractor, including those levied under the Federal Clean Water Act and the State Porter Cologne Water Quality Act.

In addition to the remedies authorized by law, an amount of the money due the Contractor under the contract, as determined by the Department, may be retained by the State of California until disposition has been made of the costs and liabilities.

The retention of money due the Contractor shall be subject to the following:

- A. The Department will give the Contractor 30 days notice of the Department's intention to retain funds from partial payments which may become due to the Contractor prior to acceptance of the contract. Retention of funds from payments made after acceptance of the contract may be made without prior notice to the Contractor.
- B. No retention of additional amounts out of partial payments will be made if the amount to be retained does not exceed the amount being withheld from partial payments pursuant to Section 9-1.06, "Partial Payments," of the Standard Specifications.
- C. If the Department has retained funds and it is subsequently determined that the State is not subject to the costs and liabilities in connection with the matter for which the retention was made, the Department shall be liable for interest on the amount retained at the legal rate of interest for the period of the retention.

Conformance with the provisions in this section "Water Pollution Control" shall not relieve the Contractor from the Contractor's responsibilities as provided in Section 7, "Legal Relations and Responsibilities," of the Standard Specifications.

#### **WATER POLLUTION CONTROL PROGRAM PREPARATION, APPROVAL AND UPDATES**

As part of the water pollution control work, a Water Pollution Control Program, hereafter referred to as the "WPCP," is required for this contract. The WPCP shall conform to the provisions in Section 7-1.01G, "Water Pollution," of the Standard Specifications, the requirements in the Handbook, and these special provisions.

No work having potential to cause water pollution, as determined by the Engineer, shall be performed until the WPCP has been approved by the Engineer.

Within 30 days after the approval of the contract, the Contractor shall submit 3 copies of the WPCP to the Engineer. The Engineer will have 7 days to review the WPCP. If revisions are required, as determined by the Engineer, the Contractor shall revise and resubmit the WPCP within 7 days of receipt of the Engineer's comments. The Engineer will have 7 days to review the revisions. Upon the Engineer's approval of the WPCP, 3 additional copies of the WPCP incorporating the required changes shall be submitted to the Engineer. Minor changes or clarifications to the initial submittal may be made and attached as amendments to the WPCP. In order to allow construction activities to proceed, the Engineer may conditionally approve the WPCP while minor revisions or amendments are being completed.

The WPCP shall identify pollution sources that may adversely affect the quality of storm water discharges associated with the project and shall identify water pollution control measures, hereafter referred to as control measures, to be constructed, implemented, and maintained in order to reduce to the extent feasible pollutants in storm water discharges from the construction site during construction under this contract.

The WPCP shall incorporate control measures in the following categories:

- A. Soil stabilization practices;
- B. Sediment control practices;
- C. Sediment tracking control practices;
- D. Wind erosion control practices; and
- E. Nonstorm water management and waste management and disposal control practices.

Specific objectives and minimum requirements for each category of control measures are contained in the Handbook.

The Contractor shall consider the objectives and minimum requirements presented in the Handbook for each of the above categories. When minimum requirements are listed for any category, the Contractor shall incorporate into the WPCP and implement on the project, one or more of the listed minimum controls required in order to meet the pollution control objectives for the category. In addition, the Contractor shall consider other control measures presented in the Handbook and shall incorporate into the WPCP and implement on the project the control measures necessary to meet the objectives of the WPCP. The Contractor shall document the selection process in conformance with the procedure specified in the Handbook.

|          |                        |
|----------|------------------------|
| Category | Minimum Requirement(s) |
|----------|------------------------|

The WPCP shall include, but not be limited to, the following items as described in the Handbook:

- A. Project description and Contractor's certification;
- B. Project information;
- C. Pollution sources, control measures, and water pollution control drawings; and
- D. Amendments, if any.

The Contractor shall amend the WPCP, graphically and in narrative form, whenever there is a change in construction activities or operations which may affect the discharge of significant quantities of pollutants to surface waters, ground waters, municipal storm drain systems or when deemed necessary by the Engineer. The WPCP shall be amended if the WPCP has not achieved the objective of reducing pollutants in storm water discharges. Amendments shall show additional control measures or revised operations, including those in areas not shown in the initially approved WPCP, which are required on the project to control water pollution effectively. Amendments to the WPCP shall be submitted for review and approval by the Engineer in the same manner specified for the initially approved WPCP. Amendments shall be dated and attached to the on-site WPCP document.

The Contractor shall keep a copy of the WPCP, together with updates, revisions and amendments at the project site.

## **WPCP IMPLEMENTATION**

Upon approval of the WPCP, the Contractor shall be responsible throughout the duration of the project for installing, constructing, inspecting, and maintaining the control measures included in the WPCP and any amendments thereto and for removing and disposing of temporary control measures. Unless otherwise directed by the Engineer or specified in these special provisions, the Contractor's responsibility for WPCP implementation shall continue throughout any temporary suspension of work ordered in conformance with the provisions in Section 8-1.05, "Temporary Suspension of Work," of the Standard Specifications. Requirements for installation, construction, inspection, maintenance, removal, and disposal of control measures are specified in the Handbook and these special provisions.

Soil stabilization practices and sediment control measures, including minimum requirements, shall be provided throughout the winter season, defined as between October 15th and April 15th.

Implementation of soil stabilization practices and sediment control measures for soil-disturbed areas on the project site shall be completed, except as provided for below, not later than 20 days prior to the beginning of the winter season or upon start of applicable construction activities for projects which begin either during or within 20 days of the winter season.

Throughout the winter season, the active, soil-disturbed area of the project site shall be not more than 0.9 hectares. The Engineer may approve, on a case-by-case basis, expansions of the active, soil-disturbed area limit. The Contractor shall demonstrate the ability and preparedness to fully deploy soil stabilization practices and sediment control measures to protect

soil-disturbed areas on the project site before the onset of precipitation. A quantity of soil stabilization and sediment control materials shall be maintained on site equal to 100 percent of that sufficient to protect unprotected, soil-disturbed areas on the project site. A detailed plan for the mobilization of sufficient labor and equipment shall be maintained to fully deploy control measures required to protect unprotected, soil-disturbed areas on the project site prior to the onset of precipitation. A current inventory of control measure materials and the detailed mobilization plan shall be included as part of the WPCP.

Throughout the winter season, soil-disturbed areas on the project site shall be considered to be nonactive whenever soil disturbing activities are expected to be discontinued for a period of 20 or more days and the areas are fully protected. Areas that will become nonactive either during the winter season or within 20 days thereof shall be fully protected with soil stabilization practices and sediment control measures within 10 days of the discontinuance of soil disturbing activities or prior to the onset of precipitation, whichever is first to occur.

Throughout the winter season, active soil-disturbed areas of the project site shall be fully protected at the end of each day with soil stabilization practices and sediment control measures unless fair weather is predicted through the following work day. The weather forecast shall be monitored by the Contractor on a daily basis. The National Weather Service forecast shall be used. An alternative weather forecast proposed by the Contractor may be used if approved by the Engineer. If precipitation is predicted prior to the end of the following work day, construction scheduling shall be modified, as required, and functioning control measures shall be deployed prior to the onset of the precipitation.

The Contractor shall implement, year-round and throughout the duration of the project, control measures included in the WPCP for sediment tracking, wind erosion, nonstorm water management, and waste management and disposal.

The Engineer may order the suspension of construction operations which create water pollution if the Contractor fails to conform to the provisions in this section "Water Pollution Control" as determined by the Engineer.

## **MAINTENANCE**

To ensure the proper implementation and functioning of control measures, the Contractor shall regularly inspect and maintain the construction site for the control measures identified in the WPCP. The Contractor shall identify corrective actions and time needed to address any deficient measures or reinitiate any measures that have been discontinued.

The construction site inspection checklist provided in the Handbook shall be used to ensure that the necessary measures are being properly implemented, and to ensure that the control measures are functioning adequately. One copy of each site inspection record shall be submitted to the Engineer.

During the winter season, inspections of the construction site shall be conducted by the Contractor to identify deficient measures, as follows:

- A. Prior to a forecast storm;
- B. After all precipitation which causes runoff capable of carrying sediment from the construction site;
- C. At 24-hour intervals during extended precipitation events; and
- D. Routinely, at a minimum of once every 2 weeks.

If the Contractor or the Engineer identifies a deficiency in the deployment or functioning of an identified control measure, the deficiency shall be corrected immediately. The deficiency may be corrected at a later date and time if requested by the Contractor and approved by the Engineer in writing, but not later than the onset of subsequent precipitation events. The correction of deficiencies shall be at no additional cost to the State.

## **PAYMENT**

Full compensation for conforming to the provisions in this section shall be considered as included in the prices paid for the various contract items of work involved and no additional compensation will be allowed therefor.

The Engineer will retain an amount equal to 25 percent of the estimated value of the contract work performed during estimate periods in which the Contractor fails to conform to the provisions in this section "Water Pollution Control" as determined by the Engineer.

Retentions for failure to conform to the provisions in this section "Water Pollution Control" shall be in addition to the other retentions provided for in the contract. The amounts retained for failure of the Contractor to conform to the provisions in this section will be released for payment on the next monthly estimate for partial payment following the date that a WPCP has been implemented and maintained and water pollution is adequately controlled, as determined by the Engineer.

## **10-1.03 COOPERATION**

Attention is directed to Section 7-1.14, "Cooperation," and Section 8-1.10, "Utility and Non-Highway Facilities," of the Standard Specifications and these special provisions.

It is anticipated that work by another contractor (County Contract No.ATPLE-5914 (010)) to reconstruct a portion of Hartman Road in Lake County on Route 29 at the intersection of Hartman Road and Route 29 may be in progress adjacent to or within the limits of this project during progress of the work on this contract.

#### **10-1.04 PROGRESS SCHEDULE (CRITICAL PATH)**

Progress schedules will be required for this contract and shall conform to the requirements of these special provisions. Progress schedules shall utilize the Critical Path Method (CPM). Attention is directed to "Cooperation" and "Obstructions" of these special provisions. Nothing in these special provisions shall be construed as relieving the Contractor from the responsibilities specified in Section 7, "Legal Relations and Responsibility," of the Standard Specifications.

#### **DEFINITIONS**

The following definitions shall apply to these special provisions:

- A. Activity.—A task or item of work that shall be performed in order to complete a project.
- B. Baseline Schedule.—The initial CPM progress schedule as accepted by the Engineer representing the Contractor's original work plan.
- C. Concurrent Delay.—Two or more delays on the critical path that occur at the same time.
- D. Contract Completion Date.—The date the Contractor is contractually obligated to complete the project, including any authorized adjustments, as specified in Section 8-1.06, "Time of Completion," of the Standard Specifications.
- E. Contractor Delay.—A delay that extends the time required to complete a controlling operation caused by and within the control of the Contractor, subcontractors at any tier or suppliers.
- F. Controlling Operation.—A feature of work or activity on the critical path.
- G. Critical Path.—In a project network, the sequence of activities yielding the longest path in a CPM analysis necessary to complete the project.
- H. Critical Path Method (CPM).—A mathematical calculation using the sequence of activities and their interrelationships, interdependencies, resources, and durations to determine the critical path that shows the expected time to complete a project.
- I. Data Date.—The day after the date through which progress updates have been calculated; everything occurring earlier than the data date is "As-Built"; and everything on or after the data date is "Planned."
- J. Early Completion Time.—The difference in time between the contract completion date and the current State-accepted scheduled completion date.
- K. Float.—The amount of time between the early start date and the late start date or the early finish date and the late finish date of any activity or group of activities in the network.
- L. Free Float.—The amount of time an activity can be delayed before delaying a subsequent activity.
- M. Fragnet.—A section or fragment of the network diagram comprised of a group of activities.
- N. Milestone.—A marker in a network which is typically used to mark a point in time or denote the beginning or end of a sequence of activities. A milestone has zero duration and zero resources, but will otherwise function in the network as if the milestone were an activity.
- O. Narrative Report.—A report that identifies potential problem areas, current and anticipated delaying factors and their impact, actions taken or proposed, proposed changes in schedule logic, extension or contraction of activities, proposed addition or deletion of activities, explanation for changes in the critical path, explanation for changes in scheduled completion date, out of sequence work, and other topics related to job progress or scheduling.
- P. Near Critical Path.—A path having 10 working days or less of total float.
- Q. Punch List.—A list of details needing attention to complete task or work for both contract item and extra work.
- R. Schedule Revision.—A change in the future portion of the schedule that modifies logic; alters construction sequences such as performing sequential activities concurrently or concurrent activities sequentially; adds or deletes activities or significantly alters activity durations, as determined or accepted by the Engineer.
- S. Scheduled Completion Date.—The Contractor's scheduled completion date as shown on the accepted baseline schedule as modified by subsequent accepted schedule updates and revisions.
- T. Time Impact Analysis.—An analysis demonstrating the estimated time impact of a contract change order, delay or other event on the scheduled completion date.
- U. Total Float.—The amount of time that an activity may be delayed without delaying the scheduled completion date.
- V. Update.—The routine modification of the CPM progress schedule through a regular monthly review to incorporate actual past progress to date by activity, projected completion dates and approved time adjustments.

## **MATERIALS (COMPUTER SYSTEM)**

The Contractor shall provide a computer system for the State's exclusive possession and use for CPM progress schedules. The minimum computer system to be furnished shall be complete with keyboard, mouse, monitor, printer and plotter. The system shall conform to the following requirements:

- A. Latest industry-available Intel Pentium processor, Motorola RISC processor or equivalent.
- B. Latest computer operating system software compatible with the selected processor, either Windows or MACINTOSH.
- C. Minimum of 64 megabytes of random access memory (RAM).
- D. Internal drives, including: one 4-gigabyte minimum hard disk drive, one 1.44-megabyte 90 mm (3.5-inch) floppy disk drive and one 32x speed CD-ROM drive.
- E. Internal fax/modem, latest speed and software version of U.S. Robotics, 3COM or equivalent.
- F. A 430 mm (17-inch) minimum, color monitor capable of at least 1,024 x 768 pixels.
- G. A color-ink-jet-type, B-size plotter compatible with the selected system capable of printing fully legible, time-scaled charts, network diagrams and reports.
- H. A manual parallel cable switching device, with connecting cables, allowing the user to alternate printing between the plotters.
- I. CPM software shall be compatible with the hardware provided, shall be the latest version of Primavera Project Planner for Windows, SureTrak for Windows, or equal, and shall be able to create files that can easily be imported into the latest version of Primavera.
- J. General software shall be the latest version of McAfee VirusScan virus protection or equal and shall be compatible with the hardware provided.
- K. Upgrades to the CPM and general software shall be provided, as the upgrades become available.

The computer hardware and software furnished by the Contractor shall be compatible with that used for the production of the CPM progress schedule required by these special provisions, including original instruction manuals and other documentation normally provided with the CPM and general software. Before delivery and setup of the computer system, the Contractor shall submit, for approval of the Engineer, a detailed list of the computer hardware and software the Contractor proposes to furnish, including an itemized schedule of costs for the system.

The Contractor shall furnish, install, set up, maintain, and repair the computer system ready-for-use, and provide plotter supplies as necessary during the course of the project at a location determined by the Engineer. The first submittal of the baseline schedule will not be considered complete until the hardware and software are installed and ready for use with the submitted baseline schedule. The Contractor shall instruct and assist the Engineer in the use of the hardware and software. When requested by the Engineer, the Contractor shall provide one 8-hour session of outside commercial training in the use of the CPM software for a maximum of 2 project staff at a location acceptable to the Engineer. Hardware repairs shall be made within 48 hours of notification by the Engineer, or replacement equipment shall be furnished and installed by the Contractor until repairs have been completed.

Computer hardware and software furnished shall remain the property of the Contractor and shall be removed by the Contractor upon acceptance of the contract if no claims involving contract progress are pending. If contract claims involving contract progress are pending, computer hardware or software shall not be removed until the final estimate has been submitted to the Contractor.

## **GENERAL**

Early completion time shall be considered a resource for the exclusive use of the Contractor. The Contractor may increase early completion time by increasing production or reallocating resources to be more efficient, or by proposing, and the State accepting, contract change orders that are the result of significant Contractor development and investment or from an appropriate share of an accepted cost reduction proposal in conformance with the provisions in Section 5-1.14, "Cost Reduction Incentive," of the Standard Specifications.

The State may reduce contract working days if the action is the result of a contract change order other than those that result from significant Contractor development and investment. The Contractor shall conduct a time impact analysis to determine the effect of the change in the same manner described in "Schedule Time Adjustment" specified herein, and shall include the impacts acceptable to the Engineer in the next update or revision.

The Contractor shall be responsible for assuring that the work sequences are logical and the network shows a coordinated plan for complete performance of the work. Failure of the Contractor to include in the schedule any element of work required for the performance of the contract shall not relieve the Contractor from completing the work within the time limit specified in the contract. If the Contractor or the Engineer discovers an undefined element of work, activity or logic, it shall be corrected by the Contractor in a schedule revision, as specified in these special provisions. If a planned activity requires

greater-than-normal daily resources to accomplish, schedule revision submittals shall include a narrative describing the activity, and the amount and use of the extraordinary resources.

The Baseline Schedule or Schedule Update submitted for acceptance shall not show variances from the requirements of these special provisions unless approved by the Engineer. The Contractor shall make specific mention of the variations in the letter of transmittal and shall make the associated adjustments to the project schedule. The Contractor will not be relieved of the responsibility for executing the work in strict conformance with the provisions in the requirements of these special provisions. In the event of a conflict between the requirements of these special provisions and the information provided or shown on an accepted schedule, the requirements of these special provisions shall take precedence.

Each schedule submitted to the Engineer shall comply with the limits imposed by these special provisions, with the specified intermediate milestones and completion dates, and with the constraints, restraints or sequences included in these special provisions, except that after the Engineer accepts the baseline schedule, the Contractor may show a late scheduled completion date on subsequent updates or revisions. The degree of detail shall include factors to the satisfaction of the Engineer, including, but not limited to:

- A. Physical breakdown of the project;
- B. Contract milestones and completion dates, substantial completion dates, constraints, restraints, sequences of work shown in these special provisions, the planned substantial completion date, and the final completion date;
- C. Type of work to be performed, the sequences and the activities to be performed by subcontractors;
- D. Procurement, submittal, submittal review, manufacture, test, delivery, and installation of major materials and equipment that require approval;
- E. Preparation, submittal and approval of shop or working drawings and material samples showing time, as specified in these special provisions for the Engineer's review;
- F. Identification of interfaces and dependencies with preceding, concurrent and follow-on contractors, railroads, and utilities as indicated in these special provisions;
- G. Identification of each utility relocation or interface as a separate activity;
- H. Batch plant erection and plant certification;
- I. Erection and removal of falsework or shoring;
- J. Submission and approval of reports or results for major tests, such as that for pile loading or traffic controllers;
- K. Indicate long-term ramp and connector closing and opening events, traffic switches, and opening and closing of pavements to traffic as separate one day activities;
- L. Punch-list and final clean-up;
- M. State-owned float as the last activity in the schedule, at the end of which is the Scheduled Completion Date;
- N. Activity coding conventions shall include the following:

|                    | Code | Value              | Description                   |
|--------------------|------|--------------------|-------------------------------|
| (1) Responsibility | RESP | CT                 | Caltrans                      |
|                    |      | UTIL               | Utility Company               |
|                    |      | RAIL               | Railroad                      |
|                    |      | xxxx               | Contractor                    |
|                    |      | xxxx               | Subcontractor                 |
|                    |      | xxxx               | others, as needed             |
| (2) Stage          | STGE | 1                  | Stage 1                       |
|                    |      | 2                  | Stage 2                       |
|                    |      | other designations | other descriptions, as needed |
| (3) Phase          | PHAS | 1                  | Phase 1                       |
|                    |      | 2                  | Phase 2                       |
|                    |      | other phases       | other phases, as needed       |
| (4) Utilities      | UTIL | PGE                | Pacific Gas & Electric        |
|                    |      | BELL               | Pacific Bell                  |
|                    |      | GTE                | GTE                           |
|                    |      | SCE                | Southern California Edison    |
|                    |      | other utilities    | other utilities, as needed    |

The Contractor may include additional coding conventions, such as Ramps (RAMP), Facilities (FAC), and Events (EVNT).

The work shall be executed in the sequence indicated in the accepted baseline schedule and subsequent accepted updates and revisions. Once the Engineer accepts a CPM schedule, the Contractor shall neither artificially improve the progress nor artificially change the quantity of float in any part of the schedule by artificially adding or deleting activities, revising schedule logic restraints, or changing planned activity durations. Schedule changes of planned work shall be documented in a properly submitted revision. The Contractor may improve the progress by performing sequential activities concurrently or by performing activities more quickly than planned. In the case of multiple critical paths, float generated by early completion of one or a sequence of activities will be considered in determining if that sequence of activities remains on the critical path.

The schedule shall be modified to reflect actual events and conditions, including non-work days, as these events and conditions occur for historical purposes and for use in time impact analysis. Submittals and Engineer review time shall be shown in the progress schedule, including CPM schedule updates and revisions. The duration of the Engineer review activity shall be 15 days unless specified otherwise in these special provisions.

The Contractor shall be allowed to show an early or late scheduled completion date on schedule updates and revisions. The Engineer will use the most current, accepted schedule update and revision, and Contractor-provided cause, time-impact and schedule-delay analysis that is acceptable to the Engineer to determine apparent impacts.

The Engineer shall have 20 days to review and accept or reject the baseline schedule. The Engineer shall have 15 days to review and accept or reject any updated or revised schedule. Rejected schedules shall be resubmitted to the Engineer within 5 days, at which time a new review period of 5 days will begin. After the baseline schedule is accepted, schedules that are not accepted or rejected within the required review period will be deemed to have been accepted by the Engineer. Acceptance of a schedule does not relieve the Contractor of the responsibility of submitting complete and accurate information.

### **PRE-CONSTRUCTION SCHEDULING CONFERENCE**

The Contractor shall schedule, and the Engineer will conduct, a Pre-construction Scheduling Conference with the Contractor's Project Manager and Construction Scheduler within 10 days after approval of the contract. At this meeting, the Engineer will review the requirements of this section of the special provisions with the Contractor. The Contractor shall submit a general time-scaled logic diagram displaying the major activities and sequence of planned operations and shall be prepared to discuss the proposed work plan and schedule methodology that complies with the requirements of these special provisions. If the Contractor proposes deviations to the construction staging of the project, the Contractor shall submit a general time-scaled logic diagram displaying the deviations and resulting time impacts and shall be prepared to discuss the proposal. At this meeting, the Contractor shall additionally submit the alpha-numeric coding structure and the activity identification system for labeling the work activities. To easily identify relationships, each activity description shall indicate its associated scope or location of work by including such terms as quantity of material, type of work, Bridge Number, Station to Station location, side of highway (such as left, right, northbound, southbound), lane number, shoulder, ramp name, ramp line descriptor or mainline. The Engineer will review and comment on the logic diagram, the coding structure and activity identification system within 15 days after submission by the Contractor. The Contractor shall make modifications to the time-scaled logic diagram, the coding structure, and activity identification system that the Engineer requests and shall employ that coding structure and identification system. The Contractor shall include the Engineer-requested modifications in the baseline schedule.

### **NETWORK DIAGRAM AND PROJECT SCHEDULE REPORTS**

Schedules submitted to the Engineer, including the baseline schedule, shall include originally-plotted time-scaled network diagram(s). Network diagrams shall be based on early start and early finish dates of activities shown. The network diagrams submitted to the Engineer shall also be accompanied by the CPM software-generated tabular reports for each activity included in the project schedule. Three different report sorts shall be provided: Early Start, Total Float, and Activity Number which shall show the predecessors and successors for each activity. Tabular reports, 215 mm x 280 mm size (8 1/2" x 11" ), shall be submitted to the Engineer and shall include at a minimum, the following:

- A. Data date;
- B. Predecessor and successor activity numbers and descriptions;
- C. Activity number and description;
- D. Activity code(s);
- E. Scheduled, or actual and remaining durations for each activity;
- F. Earliest start date (by calendar date);
- G. Earliest finish date (by calendar date);
- H. Actual start date (by calendar date);
- I. Actual finish date (by calendar date);
- J. Latest start date (by calendar date);
- K. Latest finish date (by calendar date);



- L. Free Float, in work days;
- M. Total Float, in work days;
- N. Percentage of activity complete and remaining duration for incomplete activities;
- O. Lag(s); and
- P. Imposed constraints.

The networks shall be drafted time-scaled to show a continuous flow of information from left to right. The primary path(s) of criticality shall be clearly and graphically identified on the network(s). The network diagram shall be prepared on E-size sheets, 860 mm x 1120 mm (34" x 44"), and shall have a title block in the lower right-hand corner and a timeline on each page. Exceptions to the size of the network sheets and the use of computer graphics to generate the networks shall be subject to the Engineer's approval.

The narrative report shall be organized as follows:

- A. Contractor's Transmittal Letter;
- B. Work completed during the period;
- C. Identification of unusual resources: manpower, material, or equipment restrictions or use, including multiple shifts, 6-day work weeks, specified overtime, or work at times other than regular days or hours;
- D. Description of the current critical path;
- E. Changes to the critical path since the last schedule submittal;
- F. Description of problem areas;
- G. Current and anticipated delays:
  - 1. Cause of delay,
  - 2. Impact of delay on other activities, milestones and completion dates,
  - 3. Corrective action and schedule adjustments to correct the delay;
- H. Pending items and status thereof:
  - 1. Permits,
  - 2. Change Orders,
  - 3. Time Adjustments,
  - 4. Non-Compliance Notices;
- I. Contract completion date(s) status:
  - 1. Ahead of schedule and number of days,
  - 2. Behind schedule and number of days,
  - 3. If date changes, explain the cause;
- J. Attached Updated Network Diagram and Reports.

Schedule network diagrams, tabular reports and narrative reports shall be submitted to the Engineer for acceptance in the following quantities:

- A. Two sets of originally-plotted, time-scaled network diagram(s);
- B. Two copies of each of the three sorts of the CPM software-generated tabular reports 215 mm x 280 mm size (8 1/2" x 11");
- C. One 1.44-megabyte 89 mm (3.5 inch) floppy diskette containing the schedule data;
- D. Two copies of the narrative report.

#### **BASELINE SCHEDULE REQUIREMENTS**

Within 30 days after approval of the contract, the Contractor shall submit a baseline schedule to the Engineer. The baseline project schedule shall have a data date of the first working day of the contract and shall not include any completed work to-date. The baseline schedule shall be practicable; include the entire scope of work; meet interim target dates, milestones, stage construction requirements, and internal time constraints; show logical sequence of activities; and shall not extend beyond the number of working days originally provided in these special provisions. An early completion schedule will be acceptable provided that the schedule meets the requirements of these special provisions and the Standard Specifications.

The baseline CPM progress schedule submitted by the Contractor shall have a sufficient number of activities to assure adequate planning of the project, to permit monitoring and evaluation of progress, and the analysis of time impacts. The baseline schedule shall depict how the Contractor plans to complete the whole work involved, and shall show the activities that define the critical path. Multiple critical paths and near-critical paths shall be kept to a minimum, as determined by the Engineer. A total of not more than 50 percent of the baseline schedule activities shall be critical or near-critical, unless otherwise approved by the Engineer.

Activities shall have a duration of not less than one working day nor more than 20 working days, unless otherwise approved by the Engineer. The activities in the baseline schedule, with the exception of the first and last activities, shall have a minimum of one predecessor and a minimum of one successor. The baseline schedule shall not attribute negative float or negative lag to an activity.

### **MONTHLY SCHEDULE UPDATES**

On or before the first calendar day of each month, the Contractor shall meet with the Engineer to review contract progress. At the monthly progress meeting the Contractor shall submit to the Engineer an update of the network diagram and project schedule reports as defined above. Update schedules shall have a data date of the twenty-first calendar day of the month, or other date as established by the Engineer, and shall include the information available up to that date. Durations for work that has been completed will be shown on the schedule as the work actually occurred, including Engineer submittal review and Contractor resubmittal times.

### **SCHEDULE REVISIONS**

When the Contractor proposes a revision to an accepted schedule, the Contractor shall state in writing the reasons for the change, as well as the specifics, such as, but not limited to, revisions to activities, logic, durations, and other matters pertinent to the proposed revisions. If the Engineer considers a schedule revision to be of a major nature, the Engineer may require the Contractor to revise and submit for acceptance the affected portion(s) of the project schedule and an analysis to show the effect on the entire project. In addition to the revision submittal, the Contractor shall submit a schedule update with the same data date as the revision which is to reflect the project condition just prior to implementing the revision. The Contractor shall discuss contemplated revisions with the Engineer prior to the submittal.

Within 15 days, the Contractor shall submit a revised CPM network for approval when requested by the Engineer, or when any of the following occurs:

- A. There is a significant change in the Contractor's operations that affects the critical or near critical path(s).
- B. The scheduled completion date of the current submitted updated CPM schedule indicates that the contract progress is 20 days or more behind the current accepted schedule or revision.
- C. The Contractor or the Engineer considers that an approved or anticipated change will impact the critical or near critical path or contract progress.

### **SCHEDULE TIME ADJUSTMENT**

When the Contractor requests a time adjustment due to contract change orders or delays, or if the Contractor or the Engineer considers that an approved or anticipated change will impact the critical path or contract progress, the Contractor shall submit a written time impact analysis to the Engineer illustrating the impacts of each change or delay on the current scheduled completion date or milestone completion date. The analysis shall use the currently accepted schedule that has a data date closest to and prior to the event. If the Engineer determines that the currently accepted schedule does not appropriately represent the conditions prior to the event, the schedule shall be updated to the day before the event being analyzed. An additional analysis shall be performed after the completion of the event. If the event is on the critical path at the time of its completion, then the difference between the scheduled completion dates of these 2 analyses shall be equal to the adjustment in time. The time impact analysis shall include one or more fragnet(s) demonstrating how the Contractor proposes to incorporate the event(s) into the schedule, including logic and duration of the proposed activities. Until such time that the Contractor provides the analysis, the Engineer may, at his option, construct and utilize the project as-built schedule or other recognized method to determine adjustments in contract time.

Time impact analyses shall be submitted in duplicate within 15 days of a delay and shall be used in determining contract change order days. Approval or rejection of each time impact analysis by the Engineer will be made within 15 days after receipt of the time impact analysis. In the event the Contractor does not agree with the decision of the Engineer regarding the impact of a change or delay, notice shall be given in conformance with the provisions in Section 9-1.04, "Notice of Potential Claim," of the Standard Specifications. The third paragraph of Section 4-1.03A of the Standard Specifications shall not apply.

## **FINAL SCHEDULE UPDATE**

Within 30 days after acceptance of the contract by the Director, the Contractor shall submit a final update of the schedule (as-built schedule) with actual start and actual finish dates for the activities. The Contractor shall submit a written certificate with this submittal signed by the Contractor's Project Manager and an officer of the company stating "To the best of my knowledge, the enclosed final update of the project schedule reflects the actual start and completion dates of the actual activities for the project contained herein." An officer of the company may delegate in writing the authority to sign the certificate to a responsible manager. Submittal of the final schedule update and the certification shall be a condition precedent to the release of any retained funds under the contract.

## **PAYMENT**

Progress schedule (critical path) will be paid for at a lump sum price. The contract lump sum price paid for progress schedule (critical path) shall include full compensation for furnishing all labor, material (including computer hardware and software), tools, equipment, and incidentals; and for doing all the work involved in preparing, furnishing, updating, and revising progress schedules; maintaining and repairing the computer hardware; and instructing and assisting the Engineer in the use of the computer hardware and software, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer. Payments for the progress schedule (critical path) contract item will be made as follows:

- A. A total of 50 percent of the progress schedule (critical path) contract item amount will be made upon achieving all of the following: 5 percent of all work completed, accepted baseline, all accepted required schedule updates and revisions, and required CPM training.
- B. A total of 60 percent of the progress schedule (critical path) contract item amount will be made upon achieving all of the following: 25 percent of all work completed, accepted baseline, and all accepted required schedule updates and revisions.
- C. A total of 75 percent of the progress schedule (critical path) contract item amount will be made when 50 percent of all work completed, accepted baseline, and all accepted required schedule updates and revisions.
- D. A total of 100 percent of the progress schedule (critical path) contract item amount will be made when 100 percent of all work completed, accepted baseline, all accepted required schedule updates and revisions, and a completed and certified Final Schedule Update.

The adjustment provisions in Section 4-1.03, "Changes," of the Standard Specifications shall not apply to the item of progress schedule (critical path). Adjustments in compensation for progress schedule (critical path) will not be made for any increased or decreased work ordered by the Engineer in furnishing progress schedules.

## **RETENTION**

The Department will retain an amount equal to 25 percent of the estimated value of the work performed during each estimate period in which the Contractor fails to submit pre-construction scheduling documents, an acceptable baseline, acceptable updated schedule, or acceptable revised progress schedule (critical path) conforming to the requirements of these special provisions as determined by the Engineer. Retentions for failure to submit acceptable CPM progress schedules shall be in addition to other retentions provided for in the contract. Retentions for failure to submit progress schedules (critical path) will be released for payment on the next monthly estimate for partial payment following the date that pre-construction scheduling documents and acceptable progress schedules (critical path) are submitted to the Engineer, and no interest will be due the Contractor.

## **10-1.05 OVERHEAD**

Overhead shall conform to the provisions of this section, "Overhead," of these special provisions. The Contractor will be compensated for time-related overhead in accordance with these special provisions.

Attention is directed to "Force Account Payment" and "Progress Schedule (Critical Path)" of these special provisions.

The provisions in Section 9-1.08, "Adjustment of Overhead Costs," of the Standard Specifications shall not apply.

Time-related overhead shall consist of those overhead costs, including field and home office overhead, that are in proportion to the time required to complete the work. Time-related overhead shall not include costs that are not related to time, including but not limited to, mobilization, licenses, permits, and any other charges incurred only once during the contract.

Field office overhead expenses include time-related costs associated with the normal and recurring operations of the construction project, and shall not include costs directly attributable to any of the work of the contract. Such time-related costs include, but are not limited to, the salaries and benefits of project managers, general superintendents, field office managers and other field office staff assigned to the project, and rent, utilities, maintenance, security, supplies and equipment costs of the project field office.

Home office overhead or general and administrative expenses refer to the fixed costs of operating the Contractor's business. Such costs include, but are not limited to, general administration, insurance, personnel and subcontract administration, purchasing, accounting, and project engineering and estimating. The rate of home office overhead shall exclude expenses specifically related to other contracts or other businesses of the Contractor, equipment coordination, material deliveries, and consultant and legal fees.

The quantity of time-related overhead to be paid will be measured by the working day, as specified in the Engineer's Estimate as WDAY. The estimated amount will be based on the number of working days, excluding any days for plant establishment, as specified in "Beginning of Work, Time of Completion and Liquidated Damages" of these special provisions. In the event an early completion progress schedule, as defined in "Progress Schedule (Critical Path)" of these special provisions, is submitted by the Contractor and approved by the Engineer, the quantity of time-related overhead eligible for payment will be based on the total number of working days as specified in "Beginning of Work, Time of Completion and Liquidated Damages" of these special provisions, rather than the Contractor's early completion progress schedule. The quantity of time-related overhead, as measured above, will be adjusted only as a result of suspensions and adjustments of time which revise the current contract completion date and which are also any of the following:

1. suspensions of work ordered in conformance with the provisions in Section 8-1.05, "Temporary Suspension of Work," of the Standard Specifications, except:
  - a. suspensions ordered due to weather conditions being unfavorable for the suitable prosecution of the controlling operation or operations; or
  - b. suspensions ordered due to the failure on the part of the Contractor to carry out orders given, or to perform any provision of the contract; or
  - c. any other suspensions mutually agreed upon between the Engineer and the Contractor.
2. extensions of time granted by the State in conformance with the provisions in the fifth paragraph in Section 8-1.07, "Liquidated Damages," of the Standard Specifications; or
3. reductions in contract time set forth in approved contract change orders, in conformance with the provisions in Section 4-1.03, "Changes," of the Standard Specifications.

In the event a cost reduction proposal is submitted by the Contractor, and is subsequently approved by the Engineer, which provides for a reduction in contract time, the contract amount of time-related overhead associated with the reduction in contract time shall be considered as a net savings in the total cost of time-related overhead. The Contractor will be paid 50 percent of the estimated net savings of the time-related overhead, in conformance with the provisions in Section 5-1.14, "Cost Reduction Incentive," of the Standard Specifications.

If the quantity of time-related overhead, measured as specified in this special provision, exceeds 149 percent of the number of working days specified in the Engineer's Estimate, the Contractor shall, within 60 calendar days of the Engineer's written request, submit to the Engineer an audit examination and report performed by an independent Certified Public Accountant of the Contractor's actual overhead costs. The independent Certified Public Accountant's audit examination shall be performed in conformance with the requirements of the American Institute of Certified Public Accountants Attestation Standards. The audit examination and report shall depict the Contractor's project and company-wide financial records and shall specify the actual overall average daily rates for both field and home office overhead for the entire duration of the project, and whether the costs have been properly allocated. The rates of field and home office overhead shall exclude all unallowable costs as determined in the Federal Acquisition Regulations, 48 CFR, Chapter 1, Part 31. The audit examination shall determine if the rates of field and home office overhead:

1. are allowable in conformance with the requirements of the Federal Acquisition Regulations, 48 CFR, Chapter 1, Part 31;
2. are adequately supported by reliable documentation; and
3. related solely to the project under examination.

Upon the Engineer's written request, the Contractor shall make its financial records available for audit by the State for the purpose of verifying the actual rate of time-related overhead specified in the audit submitted by the Contractor. The actual rate of time-related overhead specified in the audit, submitted by the Contractor, will be subject to approval by the Engineer.

If the Engineer elects, or if requested in writing by the Contractor, contract item payments for time-related overhead, in excess of 149 percent of the number of working days designated in the Engineer's Estimate, will be adjusted to reflect the actual rate.

The cost of performing an audit examination and submitting the report, requested by the Engineer, will be borne equally by the State and the Contractor. The division of the cost will be made by determining the cost of providing an audit

examination in conformance with the provisions of Section 9-1.03B, "Work performed by Special Forces or Other Special Services" of the Standard Specifications, and paying to the Contractor one-half of that cost.

The contract price paid per working day for time-related overhead shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in time-related overhead, complete in place, including all field and home office overhead costs incurred by the Contractor and by any joint venture partner, subcontractor, supplier or other party associated with the Contractor, and the Contractor's share of costs of audits of overhead costs requested by the Engineer, as specified in these special provisions, and as directed by the Engineer. The provisions in Sections 4-1.03B, "Increased or Decreased Quantities," 4-1.03C, "Changes in Character of the Work," of the Standard Specifications shall not apply to time-related overhead.

Full compensation for additional overhead costs involved in the performance of extra work at force account shall be considered as included in the markups specified in "Force Account Payment," of these special provisions.

Full compensation for additional overhead cost involved in performing additional contract item work that is not a controlling operation and for all overhead, other than the time-related overhead measured and paid for as specified in this section "Overhead", shall be considered as included in the various items of work involved, and no additional compensation will be allowed therefor.

For the purpose of making partial payments pursuant to the provisions in Section 9-1.06, "Partial Payments," of the Standard Specifications, the number of working days to be paid for time-related overhead in each monthly partial payment will be the number of working days, specified above to be measured for payment, that occurred during that monthly estimate period. The amount earned per working day for time-related overhead shall be either the contract item price, or 20 percent of the original total contract amount divided by the number of working days specified in "Beginning of Work, Time of Completion and Liquidated Damages," of these special provisions, whichever is the lesser.

After acceptance of the contract pursuant to the provisions in Section 7-1.17, "Acceptance of Contract," of the Standard Specifications, the amount of the total contract item price for time-related overhead not yet paid, will be included for payment in the first estimate made after acceptance of the contract in conformance with the provisions in Section 9-1.07, "Payment After Acceptance," of the Standard Specifications.

#### **10-1.06 OBSTRUCTIONS**

Attention is directed to Section 8-1.10, "Utility and Non-Highway Facilities," and Section 15, "Existing Highway Facilities," of the Standard Specifications and these special provisions.

The Contractor shall notify the Engineer and the appropriate regional notification center for operators of subsurface installations at least 2 working days, but not more than 14 calendar days, prior to performing any excavation or other work close to any underground pipeline, conduit, duct, wire or other structure. Regional notification centers include, but are not limited to, the following:

| Notification Center                                 | Telephone Number                 |
|---|----------------------------------|
| Underground Service Alert-Northern California (USA) | 1-800-642-2444<br>1-800-227-2600 |
| Underground Service Alert-Southern California (USA) | 1-800-422-4133<br>1-800-227-2600 |

It is anticipated that the following utility facilities will be relocated prior to the dates shown:

| Utility      | Location                          | Date   |
|--------------|-----------------------------------|--------|
| Pacific Bell | Sta "A" 10+25 to Sta "A" 17+65 Rt | 7/1/00 |
| Media Conn   | Sta "A" 10+25 to Sta "A" 17+65 Rt | 7/1/00 |
| PG&E         | Sta "A" 10+25 to Sta "A" 17+65 Rt | 7/1/00 |

In the event that the utility facilities mentioned above are not removed or relocated by the date specified and, if in the opinion of the Engineer, the Contractor's operations are delayed or interfered with by reason of the utility facilities not being removed or relocated by the date specified, the State will compensate the Contractor for the delays to the extent provided in Section 8-1.09, "Right of Way Delays," of the Standard Specifications, and not otherwise, except as provided in Section 8-1.10, "Utility and Non-Highway Facilities," of the Standard Specifications.

#### **10-1.07 MOBILIZATION**

Mobilization shall conform to the provisions in Section 11, "Mobilization," of the Standard Specifications.

### 10-1.08 CONSTRUCTION AREA SIGNS

Construction area signs shall be furnished, installed, maintained, and removed when no longer required in conformance with the provisions in Section 12, "Construction Area Traffic Control Devices," of the Standard Specifications and these special provisions.

Attention is directed to the provisions in "Approved Traffic Products" of these special provisions. Type II retroreflective sheeting shall not be used on construction area sign panels.

Attention is directed to "Construction Project Information Signs" of these special provisions regarding the number and type of construction project information signs to be furnished, erected, maintained, and removed and disposed of.

The Contractor shall notify the appropriate regional notification center for operators of subsurface installations at least 2 working days, but not more than 14 calendar days, prior to commencing excavation for construction area sign posts. The regional notification centers include, but are not limited to, the following:

| Notification Center                                 | Telephone Number                 |
|---|----------------------------------|
| Underground Service Alert-Northern California (USA) | 1-800-642-2444<br>1-800-227-2600 |
| Underground Service Alert-Southern California (USA) | 1-800-422-4133<br>1-800-227-2600 |

Excavations required to install construction area signs shall be performed by hand methods without the use of power equipment, except that power equipment may be used if it is determined there are no utility facilities in the area of the proposed post holes.

Sign substrates for stationary mounted construction area signs may be fabricated from fiberglass reinforced plastic as specified under "Approved Traffic Products" of these special provisions.

### 10-1.09 MAINTAINING TRAFFIC

Attention is directed to Sections 7-1.08, "Public Convenience," 7-1.09, "Public Safety," and 12, "Construction Area Traffic Control Devices," of the Standard Specifications and to the provisions in "Public Safety" and "Portable Changeable Message Sign", of these special provisions and these special provisions. Nothing in these special provisions shall be construed as relieving the Contractor from the responsibilities specified in Section 7-1.09.

Lane closures shall conform to the provisions in section "Traffic Control System for Lane Closure" of these special provisions.

Personal vehicles of the Contractor's employees shall not be parked on the traveled way including any section closed to public traffic.

Whenever vehicles or equipment are parked on the shoulder within 1.8 m of a traffic lane, the shoulder area shall be closed with fluorescent traffic cones or portable delineators placed on a taper in advance of the parked vehicles or equipment and along the edge of the pavement at 7.5 m intervals to a point not less than 7.5 m past the last vehicle or piece of equipment. A minimum of 9 cones or portable delineators shall be used for the taper. A C23 (Road Work Ahead) or C24 (Shoulder Work Ahead) sign shall be mounted on a portable sign stand with flags. The sign shall be placed where designated by the Engineer.

On Route 29, a portable changeable message sign shall be placed for each lane or shoulder closure, in advance of the first warning sign as shown on the plans, unless otherwise directed by the Engineer. Where advance warning signs in both directions are required, a portable changeable message sign shall be placed in advance of the first warning sign, for each direction of travel.

A minimum of one paved traffic lane, not less than 3.35 m wide, shall be open for use by public traffic. When construction operations are not actively in progress, not less than 2 of these lanes shall be open to public traffic.

Intermittent road closures will be allowed for periods not to exceed 10 minutes. This traffic control shall be restricted to daylight hours, as determined by the Engineer. After each closure, accumulated traffic shall pass through the work before another closure is made.

Except as noted herein, during stage construction (bridge work), one way traffic control will be permitted for a period not to exceed establishing the two-lane, two-way roadway for public traffic use when the temporary signal system controlling public traffic is in use.

Except as noted herein, the full width of the traveled way shall be open for use by public traffic on Saturdays, Sundays the day preceding designated legal holidays; designated legal holidays; and after 3:00 p.m. on Fridays.

Designated legal holidays are: January 1st, the third Monday in February, the last Monday in May, July 4th, the first Monday in September, November 11th, Thanksgiving Day, and December 25th. When a designated legal holiday falls on a Sunday, the following Monday shall be a designated legal holiday. When a designated legal holiday falls on a Saturday, the

preceding Friday shall be a designated legal holiday. When a designated holiday falls on a Monday, the full width of the traveled way shall be open for use by public traffic on the proceeding Friday, Saturday, and Sunday.

Minor deviations from the requirements of this section concerning hours of work which do not significantly change the cost of the work may be permitted upon the written request of the Contractor if, in the opinion of the Engineer, public traffic will be better served and the work expedited. These deviations shall not be adopted by the Contractor until the Engineer has approved the deviations in writing. Other modifications will be made by contract change order.

#### **10-1.10 CLOSURE REQUIREMENTS AND CONDITIONS**

Lane closures shall conform to the provisions in "Maintaining Traffic" of these special provisions and these special provisions.

The term closure, as used herein, is defined as the closure of a traffic lane or lanes, including ramp or connector lanes, within a single traffic control system.

#### **CLOSURE SCHEDULE**

By noon Monday, the Contractor shall submit a written schedule of planned closures for the following week period, defined as Friday noon through the following Friday noon.

The Closure Schedule shall show the locations and times when the proposed closures are to be in effect. The Contractor shall use the Closure Schedule request forms furnished by the Engineer. Closure Schedules submitted to the Engineer with incomplete, unintelligible or inaccurate information will be returned for correction and resubmittal. The Contractor will be notified of disapproved closures or closures that require coordination with other parties as a condition of approval.

Amendments to the Closure Schedule, including adding additional closures, shall be submitted to the Engineer, in writing, at least 3 working days in advance of a planned closure. Approval of amendments to the Closure Schedule will be at the discretion of the Engineer.

The Contractor shall confirm, in writing, all scheduled closures by no later than 8:00 a.m. 3 working days prior to the date on which the closure is to be made. Approval or denial of scheduled closures will be made no later than 4:00 p.m. 2 working days prior to the date on which the closure is to be made. Closures not confirmed or approved will not be allowed.

Confirmed closures that are cancelled due to unsuitable weather may be rescheduled at the discretion of the Engineer for the following working day.

#### **CONTINGENCY PLAN**

The Contractor shall prepare a contingency plan for reopening closures to public traffic. The Contractor shall submit the contingency plan for a given operation to the Engineer within one working day of the Engineer's request.

#### **LATE REOPENING OF CLOSURES**

If a closure is not reopened to public traffic by the specified time, work shall be suspended in conformance with the provisions in Section 8-1.05, "Temporary Suspension of Work," of the Standard Specifications. The Contractor shall not make any further closures until the Engineer has accepted a work plan, submitted by the Contractor, that will insure that future closures will be reopened to public traffic at the specified time. The Engineer will have 2 working days to accept or reject the Contractor's proposed work plan. The Contractor will not be entitled to any compensation for the suspension of work resulting from the late reopening of closures.

#### **COMPENSATION**

The Contractor shall notify the Engineer of any delay in the Contractor's operations due to the following conditions, and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of those conditions, and the Contractor's loss due to that delay could not have been avoided by rescheduling the affected closure or by judicious handling of forces, equipment and plant, the delay will be considered a right of way delay within the meaning of Section 8-1.09, "Right of Way Delays," and compensation for the delay will be determined in conformance with the provisions in Section 8-1.09:

- A. The Contractor's proposed Closure Schedule is denied and his planned closures are within the time frame allowed for closures in "Maintaining Traffic" of these special provisions, except that the Contractor will not be entitled to any compensation for amendments to the Closure Schedule that are not approved.
- B. The Contractor is denied a confirmed closure.

Should the Engineer direct the Contractor to remove a closure prior to the time designated in the approved Closure Schedule, any delay to the Contractor's schedule due to removal of the closure will be considered a right of way delay within

the meaning of Section 8-1.09, "Right of Way Delays," and compensation for the delay will be determined in conformance with the provisions in Section 8-1.09.

#### **10-1.11 TRAFFIC CONTROL SYSTEM FOR LANE CLOSURE**

A traffic control system shall consist of closing traffic lanes in conformance with the details shown on the plans, the provisions in Section 12, "Construction Area Traffic Control Devices," of the Standard Specifications, the provisions under "Maintaining Traffic" and "Construction Area Signs" of these special provisions, and these special provisions.

The provisions in this section will not relieve the Contractor from the responsibility to provide additional devices or take measures as may be necessary to comply with the provisions in Section 7-1.09, "Public Safety," of the Standard Specifications.

If components in the traffic control system are displaced or cease to operate or function as specified, from any cause, during the progress of the work, the Contractor shall immediately repair the components to the original condition or replace the components and shall restore the components to the original location.

When lane closures are made for work periods only, at the end of each work period, components of the traffic control system, except portable delineators placed along open trenches or excavation adjacent to the traveled way, shall be removed from the traveled way and shoulder. If the Contractor so elects, the components may be stored at selected central locations designated by the Engineer within the limits of the highway right of way.

On 2-lane, 2-way roadways Each vehicle used to place, maintain and remove components of a traffic control system on multilane highways shall be equipped with a Type II flashing arrow sign and radios which shall be in operation when the vehicle is being used for placing, maintaining or removing the components. Vehicles equipped with Type II flashing arrow sign not involved in placing, maintaining or removing the components when operated within a stationary type lane closure shall only display the caution display mode. The sign shall be controllable by the operator of the vehicle while the vehicle is in motion. The flashing arrow sign shown on the plans shall not be used on the vehicles which are doing the placing, maintaining and removing of components of a traffic control system and shall be in place before a lane closure requiring the sign's use is completed.

One-way traffic shall be controlled through the project in conformance with the plan entitled "Traffic Control System for Lane Closure on Two Lane Conventional Highways" and these special provisions.

When flaggers are required, all flaggers shall have radio contact with personnel in the work area.

When flaggers are required, additional advance flaggers will be required.

Utilizing a pilot car will be at the option of the Contractor. If the Contractor elects to use a pilot car, the cones shown along the centerline on the plan need not be placed. The pilot car shall have radio contact with personnel in the work area. The maximum speed of the pilot car through the traffic control zone shall be 40 kilometers per hour (25 mph).

The contract lump sum price paid for traffic control system shall include full compensation for furnishing all labor (except for flagging costs), materials (including signs), tools, equipment, and incidentals (including radios), and for doing all the work involved in placing, removing, storing, maintaining, moving to new locations, replacing, and disposing of the components of the traffic control system and for furnishing and operating the pilot car, (including driver, radios, other equipment, and labor required), as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer. Flagging costs will be paid for as provided in Section 12-2.02, "Flagging Costs," of the Standard Specifications.

The adjustment provisions in Section 4-1.03, "Changes," of the Standard Specifications shall not apply to the item of traffic control system. Adjustments in compensation for traffic control system will be made only for increased or decreased traffic control system required by changes ordered by the Engineer and will be made on the basis of the cost of the increased or decreased traffic control necessary. The adjustment will be made on a force account basis as provided in Section 9-1.03, "Force Account Payment," of the Standard Specifications for increased work and estimated on the same basis in the case of decreased work.

Traffic control system required by work which is classed as extra work, as provided in Section 4-1.03D of the Standard Specifications, will be paid for as a part of the extra work.

#### **10-1.12 TEMPORARY CREEK DIVERSION SYSTEM**

This work shall consist of constructing a temporary creek diversion system such that the entire streamflow shall be diverted around the work area, as shown on the plans or as define in these special provisions.

The temporary creek diversion shall remain within the existing right of way and easements.

Construction of the temporary creek diversion shall begin in the downstream area and continue in the upstream direction. The flow shall not be diverted until the construction of the diversion is complete.

At the Contractor's option, the temporary creek diversion may be constructed using a barrier, temporary culvert or pipe, or by pumping. Water flow shall not be impaired and the upstream or downstream passage of fish shall be assured at all times. If the Contractor chooses not to use the temporary creek diversion shown on the plans then he shall submit a temporary creek diversion plan to the Engineer, for approval, 15 days prior to the construction of the diversion.



Channel bank or barrier construction shall be adequate to prevent seepage into or from the work area, and shall not be constructed of earth or other substances subject to erosion unless first enclosed by sheet piling, rock riprap, or other protective material.

The temporary creek diversion shall be completely removed when the work is complete and the removal shall proceed from downstream in the upstream direction.

The contract lump sum price paid for temporary creek diversion system shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in diverting the creek streamflow, complete in place, including removing the temporary and any access roads, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

#### **10-1.13 TEMPORARY PAVEMENT DELINEATION**

Temporary pavement delineation shall be furnished, placed, maintained, and removed in conformance with the provisions in Section 12-3.01, "General," of the Standard Specifications and these special provisions. Nothing in these special provisions shall be construed as reducing the minimum standards specified in the Manual of Traffic Controls published by the Department or as relieving the Contractor from the responsibilities specified in Section 7-1.09, "Public Safety," of the Standard Specifications.

##### **GENERAL**

Whenever the work causes obliteration of pavement delineation, temporary or permanent pavement delineation shall be in place prior to opening the traveled way to public traffic. Centerline pavement delineation shall be provided at all times for traveled ways open to public traffic.

The Contractor shall perform the work necessary to establish the alignment of temporary pavement delineation, including required lines or marks. Surfaces to receive temporary pavement delineation shall be dry and free of dirt and loose material. Temporary pavement delineation shall not be applied over existing pavement delineation or other temporary pavement delineation. Temporary pavement delineation shall be maintained until superseded or replaced with a new pattern of temporary pavement delineation or permanent pavement delineation.

Temporary pavement markers, including underlying adhesive, and removable traffic tape which are applied to the final layer of surfacing or existing pavement to remain in place or which conflicts with a subsequent or new traffic pattern for the area shall be removed when no longer required for the direction of public traffic, as determined by the Engineer.

##### **TEMPORARY CENTERLINE DELINEATION**

Whenever centerlines are obliterated and temporary pavement delineation to replace the lines is not shown on the plans, the minimum centerline delineation to be provided for that area shall be temporary pavement markers placed at longitudinal intervals of not more than 7.3 m. The temporary pavement markers shall be the same color as the centerline the pavement markers replace. Temporary pavement markers shall be, at the option of the Contractor, one of the temporary pavement markers listed for short term day/night use (14 days or less) or long term day/night use (6 months or less) in "Approved Traffic Products" of these special provisions. The temporary pavement markers shall be placed in conformance with the manufacturer's instructions. Temporary pavement markers for long term day/night use (6 months or less) shall be cemented to the surfacing with the adhesive recommended by the manufacturer, except epoxy adhesive shall not be used to place the temporary pavement markers in areas where removal of the temporary pavement markers will be required.

Temporary centerline delineation consisting entirely of temporary pavement markers listed for short term day/night use (14 days or less), shall be placed on longitudinal intervals of not more than 7.3 m and shall be used for a maximum of 14 days on lanes opened to public traffic. Prior to the end of the 14 days the permanent pavement delineation shall be placed. If the permanent pavement delineation is not placed within the 14 days, the Contractor shall replace the temporary pavement markers and provide additional temporary pavement delineation and shall bear the cost thereof. The additional temporary pavement delineation to be provided shall be equivalent to the pattern specified for the permanent pavement delineation for the area, as determined by the Engineer.

Full compensation for furnishing, placing, maintaining, and removing the temporary pavement markers (including underlying adhesive, layout (dribble) lines to establish alignment of temporary pavement markers or used for temporary laneline and centerline delineation) for those areas where temporary laneline and centerline delineation is not shown on the plans and for providing equivalent patterns of permanent traffic lines for those areas when required, shall be considered as included in the contract prices paid for the items of work that obliterated the laneline and centerline pavement delineation and no separate payment will be made therefor.

### **TEMPORARY TRAFFIC STRIPE (PAINT)**

Temporary traffic stripe consisting of painted traffic stripe shall be applied and maintained at the locations shown on the plans. The painted temporary traffic stripe shall be complete in place at the location shown prior to opening the traveled way to public traffic. Removal of painted temporary traffic stripe will not be required.

Temporary painted traffic stripe shall conform to the provisions in Section 84-3, "Painted Traffic Stripes and Pavement Markings," of the Standard Specifications, except for payment. At the option of the Contractor, either one or 2 coats shall be applied regardless of whether on new or existing pavement.

At the Contractor's option, temporary removable striping tape listed in "Approved Traffic Products" of these special provisions may be used instead of painted temporary traffic stripes. When traffic stripe tape is used in place of painted temporary traffic stripes, the tape will be measured and paid for by the meter as temporary traffic stripe (paint).

When painted traffic stripe is specified for temporary left edgeline delineation, temporary pavement markers placed at longitudinal intervals of not more than 1.8 m may be used in place of the temporary painted traffic stripe. Temporary pavement markers shall be one of the types of temporary pavement markers listed for long term day/night use (6 months or less) in "Approved Traffic Products" of these special provisions. When temporary reflective pavement markers are used in place of temporary painted traffic stripe, payment for those temporary pavement markers will be made on the basis of the theoretical quantity of temporary traffic stripe (paint) required for the left edgeline the temporary pavement markers replace.

### **TEMPORARY PAVEMENT MARKING (TAPE)**

Temporary pavement marking consisting of removable pavement marking tape shall be applied at the locations shown on the plans. The temporary pavement marking tape shall be complete in place at the location shown, prior to opening the traveled way to public traffic.

Removable pavement marking tape shall be the temporary removable type pavement marking tape listed in "Approved Traffic Products" of these special provisions and shall be applied and removed in conformance with the provisions specified for applying and removing the temporary traffic stripe tape.

### **TEMPORARY PAVEMENT MARKING (PAINT)**

Temporary pavement marking consisting of painted pavement marking shall be applied and maintained at the locations shown on the plans. The painted temporary pavement marking shall be complete in place at the location shown prior to opening the traveled way to public traffic. Removal of painted temporary pavement marking will not be required.

Temporary painted pavement marking shall conform to the provisions in Section 84-3, "Paint Traffic Stripes and Pavement Markings", of the Standard Specifications, except for payment. At the option of the Contractor, either one or 2 coats shall be applied regardless whether on new or existing pavement.

At the Contractor's option, temporary removable pavement marking tape or permanent pavement marking tape listed in "Approved Traffic Products" of these special provisions may be used instead of painted temporary pavement markings. When pavement marking tape is used, regardless of which type of tape is placed, the tape will be measured and paid for by the square meter as temporary pavement marking (paint).

### **MEASUREMENT AND PAYMENT**

Temporary pavement marking (tape) will be measured and paid for by the square meter for actual area of the pavement marking that receives tape.

Temporary traffic stripe (paint) and temporary pavement marking (paint) will be measured and paid for in the same manner specified for paint traffic stripe (1-coat) and paint pavement marking (1-coat) in Section 84-3.06, "Measurement," and Section 84-3.07, "Payment," of the Standard Specifications.

The contract price paid per square meter for temporary pavement marking (tape) shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in applying, maintaining and removing temporary pavement marking tape, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

### **10-1.14 PORTABLE CHANGEABLE MESSAGE SIGN**

Portable changeable message signs shall be furnished, placed, operated, and maintained during each lane closure at locations approved by the Engineer in conformance with the provisions in Section 12, "Construction Area Traffic Control Devices," of the Standard Specifications and these special provisions.

Attention is directed to "Maintaining Traffic" of these special provisions regarding the use of the portable changeable message signs.

### **10-1.15 TEMPORARY SIGNAL SYSTEM**

The temporary signal system (TSS) shall consist of installing, maintaining and removing temporary traffic signal and lighting for traffic control in conformance with the details shown on the plan entitled "Temporary Signal System," the provisions in "Maintaining Traffic" of these special provisions, the provisions in Section 86, "Signals, Lighting and Electrical Systems," of the Standard Specifications, and these special provisions.

The provisions in this section shall not relieve the Contractor from the responsibility to provide the additional devices or take the measures as may be necessary to conform to the provisions in Section 7-1.09, "Public Safety," of the Standard Specifications.

The following materials and equipment for the temporary signal system will be furnished to the Contractor:

- A. Lamps and red LED signal modules for vehicle traffic signal units.
- B. One Model 170 traffic signal controller assembly (including wired cabinet, controller unit and loop detector sensor units).
- C. Dual effort detectors sensors.

Except for the State-furnished material specifically called out in these special provisions or on project plans, all other materials and equipment for a temporary signal system including, but not limited to, generator, automatic transfer switch (ATS), uninterruptible power supply (UPS), signal heads, mast arms, luminaires, wood poles, conductors, and hardware shall be furnished by the Contractor.

Materials and equipment to be used in the temporary signal system shall be either new or used suitable for the intended use. Detector lead-in cables, conductors and loop wires shall be new.

Each signal face shall be oriented to be clearly visible to traffic approaching from the direction which the signal is intended to control. All vehicle signal faces shall have 300 mm sections with backplates. All signal faces shall be covered when not in use.

### **OPERATION OF TEMPORARY SIGNAL SYSTEM**

Temporary signal system shall operate at nominal 120 V(ac). Lighting shall operate at 240 V(ac).

Unless otherwise directed by the Engineer, the system shall be operated on a continuous 24-hour basis except for the periods when it is necessary to control traffic by flaggers.

Timing of a temporary signal system will be performed by State forces.

### **MAINTAINING TEMPORARY SIGNAL SYSTEM**

Maintaining a temporary signal system, except the controller assembly, shall be the sole responsibility of the Contractor.

If components in the temporary signal system are damaged, displaced or cease to operate or function as specified, from any cause during the progress of the work, the Contractor shall immediately repair the components to the original condition or replace the components and shall restore the components to the original location. Components shall include signs, generator and signal equipment.

In the event the temporary signal system is out of operation, for any reason, the Contractor shall provide flaggers, at the Contractor's expense, to maintain traffic control until the traffic signals are returned to service. Temporary traffic signal shutdowns when allowed by the Engineer shall be limited to the hours between 9:00 a.m. and 3:00 p.m. Flaggers shall be used for traffic control during these hours. The switchover from Stage 1 construction to Stage 2 construction shall be during these hours.

### **CONDUIT**

Conduit to be installed underground shall be Type 1 or Type 3 unless otherwise specified.

Conduit sizes shown on the plans and specified in the Standard Specifications and these special provisions are referenced to metallic type conduit. When rigid non-metallic conduit is required or allowed, the nominal equivalent industry size shall be used as shown in the following table:

| Size Designation for Metallic Type Conduit | Equivalent Size for Rigid Non-metallic Conduit |
|--|--|
| 21   | 20   |
| 27   | 25   |
| 41   | 40   |
| 53   | 50   |
| 63   | 65   |
| 78   | 75   |
| 103  | 100  |

When a standard coupling cannot be used for joining Type 1 conduit, a UL listed threaded union coupling, as specified in the third paragraph in Section 86-2.05C, "Installation," of the Standard Specifications, or a concrete-tight split coupling or concrete-tight set screw coupling shall be used.

### **CONDUCTORS AND WIRING**

The minimum insulation thickness, at any point, for Type USE, RHH or RHW wire shall be 1.0 mm for conductor sizes No. 14 to No. 10, inclusive, and 1.3 mm for No. 8 to No. 2, inclusive. The minimum insulation thickness, at any point, for Type THW and TW wires shall be 0.69 mm for conductor sizes No. 14 to No. 10, inclusive, 1.02 mm for No. 8, and 1.37 mm for No. 6 to No. 2, inclusive.

Conductors shall be the types specified in Section 86-2.08, "Conductors," of the Standard Specifications of the size and number of conductors shown on the plans.

Where conductors are to be placed across paved areas, the conductors shall be suspended at least 7.6 m above the roadway.

Conductors to a terminal compartment or signal head on a pole may be spliced to through conductors of the same phase in a NEMA Type 3R enclosures.

At the option of the Contractor, overhead conductors may be aluminum and multi-conductor cables or single conductors may be used. Multi-conductor cables are not required to follow the color code in the Standard Specifications.

Splices shall be insulated by "Method B" or, at the Contractor's option, splices of conductors shall be insulated with heat-shrink tubing of the appropriate size after thoroughly painting the spliced conductors with electrical insulating coating.

Aerial cables and conductors shall be supported by a messenger cable, which shall be securely attached at each end by using galvanized eye bolts and 3-bolts clamps, preformed dead-end grips or wire grips. Aerial cables and conductors shall be attached to the messenger cable every meter. The supporting messenger cable shall not be used as a branch-circuit conductor.

### **BONDING AND GROUNDING**

Signal heads, ground wire in non-metallic conduits and the controller cabinet shall be mechanically and electrically secure to form a continuous system effectively grounded by the grounding conductor.

Generator neutral grounding shall conform to the provisions for multiple service points in Section 86-2.10, "Bonding and Grounding," of the Standard Specifications.

### **SERVICE**

The Contractor shall provide power for the TSS with commercial power and generator backup, accompanied with an online UPS

The use of power from private parties, other than a direct connection to a utility company service point, will not be permitted.

Electrical power shall not be used from existing highway facilities, except when approved in writing by the Engineer.

The Contractor shall make the arrangements with the utility company to provide service. The cost to provide commercial power shall be at the expense of the Contractor. Electrical energy used for the temporary signal system prior to completion of the contract will be paid for by the State.

### **GENERATOR**

Generators shall be commercial continuous duty and shall be 120/240-V, 60 Hz, 5.0 kW minimum, continuous duty type. Generators may be powered by gasoline, LPG or diesel engines operating at approximately 1800 revolutions per minute. Engines shall be provided with automatic oil feed. Generator system shall be equipped to provide automatic start-stop operation, with 12-V starting system. Generator output circuit shall have overcurrent protection with a maximum setting of 30 A or as shown on the plans.

Fuel storage shall be sufficient for periods of time during which the generator system will be operated unattended. The fuel storage containers shall be provided with easily readable fuel gages.

The generator shall be located in the vicinity of the controller as shown on the plans. The generator shall be a maximum distance of 15 m from the controller assembly.

Engines shall be equipped with approved spark arresters.

### **GENERATOR OPERATION**

A generator shall be provided to back up the commercial power.

An automatic transfer switch shall provide the following functions:

- A. Monitor line voltage and, in the event of a power outage, signal the generator to start.
- B. An engine start delay, adjustable from 0 to 6 seconds, to prevent starting if the power outage is only momentary and an engine stop delay, adjustable from 0 to 8 minutes, to allow the generator set to run unloaded to cool prior to shut down.
- C. A transfer delay of 0 to 120 seconds to allow the generator to stabilize before connecting to the load and retransfer delay of 0 to 32 seconds to allow the line voltage to stabilize.
- D. A "Load-No Load" switch to allow test with or without load.
- E. A "Normal-Test" switch that will start and run the generator in the "Test" position. "Normal" position shall return the generator to automatic operation.
- F. A battery charger that is powered by the normal line voltage.
- G. A generator voltage sensor that signals for a transfer when the generator output is ready.

A mechanical interlock shall be provided to prevent application of power to the load from both sources and to prevent backfeeding from the generator to the line.

The automatic transfer switch shall be rated at 100 A, 120/240-V, 3-wire, single-phase and shall be compatible with the generator furnished.

An on-line uninterruptible power supply (UPS) shall be provided by the Contractor that will supply power to operate the signal during transfer operation at the time that the generator is starting up in the event of loss of commercial power. The UPS shall have sufficient capacity to operate the signal for a minimum of 5 minutes. The UPS shall automatically provide power upon loss of commercial power and shall automatically be online with generator power. The generator voltage sensor shall signal for a transfer when the generator output is ready. The Contractor will demonstrate to the Engineer that the UPS, ATS, generator and commercial power all function properly. The testing shall include, but not be limited to, simulating commercial power loss and generator power loss. The 5 minute sole UPS power source shall be tested. The UPS shall be 2.5 kW (or larger), 120 V, single phase and capable of supplying 20 A minimum.

### **STATE-FURNISHED CONTROLLER ASSEMBLY**

The Contractor shall construct the controller cabinet foundation as shown on Standard Plan ES-3C for Model 332, 334 or 336 cabinets (including furnishing and installing anchor bolts), shall install the controller cabinet on the foundation, and shall make field wiring connections to the terminal blocks in the controller cabinet.

A listing of field conductor terminations, in each State-furnished controller cabinet, will be furnished free of charge to the Contractor at the site of the work.

State forces will maintain all controller assembly.

### **DETECTORS**

Loop detector sensor units will be State-furnished as part of the controller assembly.

Loop detector lead-in cable shall be Type B.

Loop wire shall be Type 2.

Slots shall be filled with hot-melt rubberized asphalt sealant.

The loops shall be Type A or Type C as shown on the plans.

The depth of loop sealant above the top of the uppermost loop wire in the sawed slots shall be 50 mm, minimum. The loops shall be cut in the same day as the signal switchover from Stage 1 to Stage 2 construction. The Contractor shall inform the Engineer three days in advance of cutting loops for Stage 2 construction.

### **WOOD POLES**

Wood poles shall be marked with reflectorized tape, facing approaching traffic.

The lengths of wood poles with luminaires shall be 12.2 m minimum.

Guy wires with guards and strain insulators shall be installed where necessary to maintain vertical alignment and horizontal clearance. Guy guards shall be marked with reflectorized tape when subject to vehicular or pedestrian traffic.

## **TESTING**

The Contractor shall perform a preliminary field test to show that the TSS system, including the generator system, automatic transfer switch and the UPS (Uninterruptible Power Supply), is installed and operating correctly. All tests shall be performed in the presence of the Engineer.

Initial turn-on of the system shall not be made without the approval of the Engineer. Initial turn-on shall be made prior to 1:00 p.m. on any working day, except turn-on will not be allowed on Fridays or the day prior to a legal holiday.

## **REMOVAL AND SALVAGING OF SCOUR MEASUREMENT INSTRUMENTATION SYSTEM**

The existing scour measurement instrumentation system attached to bridge rail on the east side of the Route 29 shall remain functional as long as it does not interfere with the Contractor's operations.

The Contractor shall provide a five days advance notice to the Engineer prior to any work that will interfere with the existing scour measurement instrumentation system.

The Contractor shall not cut, remove or disconnect any wire connections or any part of the scour measurement instrumentation system. State forces will perform this removal and salvaging of the system. The Contractor shall provide access to the scour measurement instrumentation system devices by a moveable scaffold that mounts over the bridge rail. The Contractor shall place and remove the scaffold to the locations for the salvage operation.

## **SALVAGING SIGNAL SYSTEM**

Upon completion of the work requiring temporary traffic signals, as determined by the Engineer, State-furnished components of the temporary signal system shall be salvaged and delivered to the 90 West Lake Mendocino Drive, Ukiah, CA 95482.

Other materials and equipment shall become the property of the Contractor and shall be disposed of in conformance with the provisions in Section 7-1.13, "Disposal of Materials Outside the Highway Right of Way," of the Standard Specifications. Pole holes shall be backfilled.

## **PAYMENT**

The contract lump sum price paid for temporary signal system shall include full compensation for furnishing all labor, materials (except State-furnished materials), tools, equipment, and incidentals, and for doing all the work involved in installing, maintaining, and removing the temporary traffic signal and lighting, system, and hauling State-furnished materials from and to the location specified, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Full compensation for providing access and scaffolding to salvage the existing scour measurement instrumentation system shall be considered as included in the contract lump sum price paid for temporary signal system and no separate payment will be made therefor.

## **10-1.16 TEMPORARY SOLAR POWER FLASHING BEACON SYSTEM**

Temporary solar power flashing beacon (TFB) system shall be constructed as units and shall consist of installing, maintaining, and removing TFB system in conformance with the details shown on the plans, the provisions in "Maintaining Traffic" of these special provisions, the provisions in Section 86, "Signals, Lighting and Electrical Systems," of the Standard Specifications, and these special provisions.

TFB system shall be installed as shown on the plans at each end/leg of the construction area and shall be relocated during the progress of the work so that the systems are located at all ends of pavement at the end of each work shift.

The provisions in this section shall not relieve the Contractor from the responsibility to provide additional devices or take measures as may be necessary to conform to the provisions in Section 7-1.09, "Public Safety," of the Standard Specifications.

Materials and equipment to be used in the TFB system shall be either new or used suitable for the intended use.

Sign panels to be installed on the TFB system shall be reflectorized stationary mounted construction area signs conforming to the provisions in "Construction Area Signs" of these special provisions.

The Contractor shall provide the sign panel to be mounted on flashing beacon standard, the flasher, solar panels and mounting brackets, amber LED signal sections, batteries and all other components of the circuit for proper operation.

Standards for TFB system units shall be wood posts. Wood posts shall be the sizes shown on the plans and shall conform to the provisions in Section 56-2.02B, "Wood Posts and Braces," and Section 56-2.03, "Construction," of the Standard Specifications and shall be installed as shown on the plans for roadside signs.

The Contractor shall complete all mechanical and electrical connections to operate the temporary solar power flashing beacon system. The signal beacon head assembly shall consist of the following:

A 300-mm aluminum coated black head with prismatic amber lens.  
Necessary solid state electronics to enable flasher operation.  
Polycarbonate housing to protect circuitry from dust and moisture.

Each beacon shall be provided with a backplate, visor, flasher assemble, NEMA 3R enclosure, circuit breaker or switch.  
The yellow LED signal unit shall be:

A 420 LED signal unit using 1200 mcd with luminosity of 504 candles approximately.  
Viewing angle 30 degrees.  
Operating Temperature Range: -30 to +85°C.  
Night sensitive dimming/flashing module rated at 50% connected load.

Any applicable specification not outlined here, shall conform to section 86-4.02 of the Standard Specifications.

### **OPERATION OF TEMPORARY SOLAR POWER FLASHING BEACONS**

The TFB system shall operate at 12 V(dc) as shown on the plans. The flash rate and battery recharge time shall conform to the provisions in Section 12-3.05, "Portable flashing beacon," of the Standard Specifications.

Unless otherwise directed by the Engineer, the system shall be operated on a continuous 24-hour basis during periods that public traffic is directed to travel on unpaved areas or on unfinished pavement.

### **MAINTAINING TFB SYSTEM**

Maintaining the TFB system shall be the sole responsibility of the Contractor.

If components in the TFB system are damaged, displaced or cease to operate or function as specified, from any cause, during the progress of the work, the Contractor shall immediately repair the components to the original condition or replace the components and shall restore the components to the original location or to an alternate location designated by the Engineer.

### **CONDUCTORS AND WIRING**

The minimum insulation thickness, at any point, for Type USE, RHH or RHW wire shall be 1.0 mm for conductor sizes No. 14 to No. 10, inclusive, and 1.3 mm for No. 8 to No. 2, inclusive. The minimum insulation thickness, at any point, for Type THW and TW wires shall be 0.69 mm for conductor sizes No. 14 to No. 10, inclusive, 1.02 mm for No. 8, and 1.37 mm for No. 6 to No. 2, inclusive.

### **PAYMENT**

The contract lump sum price paid for temporary solar power flashing beacon system shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in furnishing, placing, operating, maintaining, repairing, replacing, and disposing of the TFB system, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Full compensation for relocating the TFB system during the progress of the work, regardless of the number of times the TFB system is required, shall be considered as included in the contract lump sum price paid for temporary solar power flashing beacon system and no separate payment will be made therefor.

Full compensation for furnishing, installing, maintaining, and disposing of construction area signs for the TFB system shall be considered as included in the contract lump sum price paid for temporary solar power flashing beacon system and no additional compensation will be allowed therefor.

### **10-1.17 TEMPORARY RAILING**

Temporary railing (Type K) shall be placed as shown on the plans, as specified in the Standard Specifications or these special provisions or where ordered by the Engineer and shall conform to the provisions in Section 12, "Construction Area Traffic Control Devices," of the Standard Specifications and these special provisions.

Reflectors on temporary railing (Type K) shall conform to the provisions in "Approved Traffic Products" of these special provisions.

Temporary railing (Type K) shall conform to the details shown on Standard Plan T3. Temporary railing (Type K) fabricated prior to January 1, 1993, and conforming to 1988 Standard Plan B11-30 may be used, provided the fabrication date is printed on the required Certificate of Compliance.

Attention is directed to "Public Safety" and "Order of Work" of these special provisions.

Temporary railing (Type K) placed in conformance with the provisions in "Public Safety" of these special provisions will be neither measured nor paid for.

### **10-1.18 CHANNELIZER**

Channelizers shall conform to the provisions in Section 12, "Construction Area Traffic Control Devices," of the Standard Specifications and these special provisions.

Channelizers shall conform to the provisions in "Approved Traffic Products" of these special provisions.

When no longer required for the work as determined by the Engineer, channelizers and underlying adhesive used to cement the channelizer bases to the pavement shall be removed. Removed channelizers and adhesive shall become the property of the Contractor and shall be removed from the site of work.

### **10-1.19 TEMPORARY CRASH CUSHION MODULE**

This work shall consist of furnishing, installing, and maintaining sand filled temporary crash cushion modules in groupings or arrays at each location shown on the plans, as specified in these special provisions or where designated by the Engineer. The grouping or array of sand filled modules shall form a complete sand filled temporary crash cushion in conformance with the details shown on the plans and these special provisions.

Attention is directed to "Public Safety", "Order of Work", and "Temporary Railing" of these special provisions.

#### **GENERAL**

Whenever the work or the Contractor's operations establishes a fixed obstacle, the exposed fixed obstacle shall be protected with a sand filled temporary crash cushion. The sand filled temporary crash cushion shall be in place prior to opening the lanes adjacent to the fixed obstacle to public traffic.

Sand filled temporary crash cushions shall be maintained in place at each location, including times when work is not actively in progress. Sand filled temporary crash cushions may be removed during a work period for access to the work provided that the exposed fixed obstacle is 4.6 m or more from a lane carrying public traffic and the temporary crash cushion is reset to protect the obstacle prior to the end of the work period in which the fixed obstacle was exposed. When no longer required, as determined by the Engineer, sand filled temporary crash cushions shall be removed from the site of the work.

#### **MATERIALS**

At the Contractor's option, the modules for use in sand filled temporary crash cushions shall be either Energite III Inertial Modules, Fitch Inertial Modules or Traffix Sand Barrels manufactured after March 31, 1997, or equal:

- A. Energite III Inertial Modules, manufactured by Energy Absorption Systems, Inc., One East Wacker Drive, Chicago, IL 60601-2076, Telephone 1-312-467-6750, FAX 1-800-770-6755.
  - 1. Distributor (Northern): Traffic Control Service, Inc., 8585 Thys Court, Sacramento, CA 95828, Telephone 1-800-884-8274, FAX 1-916-387-9734
  - 2. Distributor (Southern): Traffic Control Service, Inc., 1881 Betmor Lane, Anaheim, CA 92805, Telephone 1-800-222-8274, FAX 1-714-937-1070.
- B. Fitch Inertial Modules, manufactured by Roadway Safety Service, Inc., 1050 North Rand Road, Wauconda, IL 60084, Telephone 1-800-426-0839, FAX 1-847-487-9820.
  - 1.. Distributor (Northern): Traffic Control Service, Inc., 8585 Thys Court, Sacramento, CA 95828, Telephone 1-800-884-8274, FAX 1-916-387-9734
  - 2. Distributor (Southern): Traffic Control Service, Inc., 1881 Betmor Lane, Anaheim, CA 92805, Telephone 1-800-222-8274, FAX 1-714-937-1070.
- C. Traffix Sand Barrels, manufactured by Traffix Devices, Inc., 220 Calle Pintoresco, San Clemente, CA 92672, Telephone 1-949-361-5663, FAX 1-949-361-9205.
  - 1. Russ Enterprises, Inc., 1533 Berger Drive, San Jose, CA 95112, Telephone 1-408-287-4303, FAX 1-408-287-1929.
  - 2. Statewide Safety, P.O. Box 1440, Pismo Beach, CA 93448, Telephone 1-800-559-7080, FAX 1-805-929-5786.

Modules contained in each temporary crash cushion shall be of the same type at each location. The color of the modules shall be the standard yellow color, as furnished by the vendor, with black lids. The modules shall exhibit good workmanship free from structural flaws and objectionable surface defects. The modules need not be new. Good used undamaged modules conforming to color and quality of the types specified herein may be utilized. If used Fitch modules requiring a seal are



furnished, the top edge of the seal shall be securely fastened to the wall of the module by a continuous strip of heavy duty tape.

Modules shall be filled with sand in conformance with the manufacturer's directions, and to the sand capacity in kilograms for each module shown on the plans. Sand for filling the modules shall be clean washed concrete sand of commercial quality. At the time of placing in the modules, the sand shall contain not more than 7 percent water as determined by California Test 226.

Modules damaged due to the Contractor's operations shall be repaired immediately by the Contractor at the Contractor's expense. Modules damaged beyond repair, as determined by the Engineer, due to the Contractor's operations shall be removed and replaced by the Contractor at the Contractor's expense.

## **INSTALLATION**

Temporary crash cushion modules shall be placed on movable pallets or frames conforming to the dimensions shown on the plans. The pallets or frames shall provide a full bearing base beneath the modules. The modules and supporting pallets or frames shall not be moved by sliding or skidding along the pavement or bridge deck.

A Type R or P marker panel shall be attached to the front of the crash cushion as shown on the plans, when the closest point of the crash cushion array is within 3.6 m of the traveled way. The marker panel, when required, shall be firmly fastened to the crash cushion with commercial quality hardware or by other methods determined by the Engineer.

At the completion of the project, temporary crash cushion modules, sand filling, pallets or frames, and marker panels shall become the property of the Contractor and shall be removed from the site of the work. Temporary crash cushion modules shall not be installed in the permanent work.

## **MEASUREMENT AND PAYMENT**

Temporary crash cushion modules will be measured by the unit as determined from the actual count of modules used in the work or ordered by the Engineer at each location. Temporary crash cushion modules placed in conformance with the provisions in "Public Safety" of these special provisions and modules placed in excess of the number specified or shown will not be measured nor paid for.

Repairing modules damaged by public traffic will be paid for as extra work as provided in Section 4-1.03D of the Standard Specifications. Modules damaged beyond repair by public traffic, when ordered by the Engineer, shall be removed and replaced immediately by the Contractor. Modules replaced due to damage by public traffic will be measured and paid for as temporary crash cushion module.

If the Engineer orders a lateral move of the sand filled temporary crash cushions and the repositioning is not shown on the plans, moving the sand filled temporary crash cushion will be paid for as extra work as provided in Section 4-1.03D of the Standard Specifications and these temporary crash cushion modules will not be counted for payment in the new position.

The contract unit price paid for temporary crash cushion module shall include full compensation for furnishing all labor, materials (including sand, pallets or frames and marker panels), tools, equipment, and incidentals, and for doing all the work involved in furnishing, installing, maintaining, moving, and resetting during a work period for access to the work, and removing from the site of the work when no longer required (including those damaged by public traffic) sand filled temporary crash cushion modules, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

## **10-1.20 EXISTING HIGHWAY FACILITIES**

The work performed in connection with various existing highway facilities shall conform to the provisions in Section 15, "Existing Highway Facilities," of the Standard Specifications and these special provisions.

Plans of the existing bridges may be requested by fax from the Office of Structure Maintenance and Investigations, 1801 30th Street, Sacramento, CA, Fax (916) 227-8357.

Plans of the existing bridges available to the Contractor are reproductions of the original contract plans with significant changes noted and working drawings and do not necessarily show normal construction tolerances and variances. Where dimensions of new construction required by this contract are dependent on the dimensions of the existing bridges, the Contractor shall verify the controlling field dimensions and shall be responsible for adjusting dimensions of the work to fit existing conditions.

## **REMOVE FENCE**

Existing fence, at those locations shown on the plans to be removed, shall be removed and disposed of.

## **REMOVE METAL BEAM GUARD RAILING**

Existing metal beam guard railing, where shown on the plans to be removed, shall be removed and disposed of.

Existing concrete anchors shall be completely removed and disposed of. Full compensation for removing concrete anchors shall be considered as included in the contract price paid per meter for remove metal beam guard railing and no separate payment will be made therefor.

Full compensation for removing cable anchor assemblies or terminal anchor assemblies shall be considered as included in the contract price paid per meter for remove metal beam guard railing and no separate payment will be made therefor.

#### **REMOVE FLARED END SECTION**

Existing flared end sections, at locations shown on the plans to be removed, shall be removed and disposed of.

#### **REMOVE PAVEMENT MARKER**

Existing pavement markers, including underlying adhesive, when no longer required for traffic lane delineation as determined by the Engineer, shall be removed and disposed of.

Full compensation for removing and disposing of pavement markers and underlying adhesive shall be considered as included in the contract price paid per tonne for asphalt concrete (Type A) and no separate payment will be made therefor.

#### **REMOVE ROADSIDE SIGN**

Existing roadside signs, at those locations shown on the plans to be removed, shall be removed and disposed of.

Sign panels shown on the plans shall be salvaged.

Existing roadside signs shall not be removed until replacement signs have been installed or until the existing signs are no longer required for the direction of public traffic, unless otherwise directed by the Engineer.

#### **RESET ROADSIDE SIGN**

Existing roadside signs, where shown on the plans to be reset, shall be removed and reset.

Each roadside sign shall be reset on the same day that the sign is removed.

Two holes shall be drilled in each existing post as required to provide the breakaway feature shown on the plans.

#### **RELOCATE ROADSIDE SIGN**

Existing roadside signs shall be removed and relocated to the new locations shown on the plans.

Each roadside sign shall be installed at the new location on the same day that the sign is removed from its original location.

Two holes shall be drilled in each existing post as required to provide the breakaway feature shown on the plans.

#### **COLD PLANE ASPHALT CONCRETE PAVEMENT**

Existing asphalt concrete pavement shall be cold planed at the locations and to the dimensions shown on the plans.

Planing asphalt concrete pavement shall be performed by the cold planing method. Planing of the asphalt concrete pavement shall not be done by the heater planing method.

Cold planing machines shall be equipped with a cutter head not less than 750 mm in width and shall be operated so that no fumes or smoke will be produced. The cold planing machine shall plane the pavement without requiring the use of a heating device to soften the pavement during or prior to the planing operation.

The depth, width, and shape of the cut shall be as shown on the typical cross sections or as designated by the Engineer. The final cut shall result in a uniform surface conforming to the typical cross sections. The outside lines of the planed area shall be neat and uniform. Planing asphalt concrete pavement operations shall be performed without damage to the surfacing to remain in place.

Planed widths of pavement shall be continuous except for intersections at cross streets where the planing shall be carried around the corners and through the conform lines. Following planing operations, a drop-off of more than 45 mm will not be allowed between adjacent lanes open to public traffic.

Where transverse joints are planed in the pavement at conform lines no drop-off shall remain between the existing pavement and the planed area when the pavement is opened to public traffic. If asphalt concrete has not been placed to the level of existing pavement before the pavement is to be opened to public traffic a temporary asphalt concrete taper shall be constructed. Asphalt concrete for temporary tapers shall be placed to the level of the existing pavement and tapered on a slope of 1:200 (Vertical: Horizontal) or flatter to the level of the planed area.

Asphalt concrete for temporary tapers shall be commercial quality and may be spread and compacted by any method that will produce a smooth riding surface. Temporary asphalt concrete tapers shall be completely removed, including the removal of loose material from the underlying surface, before placing the permanent surfacing. The removed material shall be disposed of outside the highway right of way in conformance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

Operations shall be scheduled so that not more than 7 days shall elapse between the time when transverse joints are planed in the pavement at the conform lines and the permanent surfacing is placed at the conform lines.

The material planed from the roadway surface, including material deposited in existing gutters or on the adjacent traveled way, shall be removed and disposed of outside the highway right of way in conformance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications. Removal operations of cold planed material shall be concurrent with planing operations and follow within 15 m of the planer, unless otherwise directed by the Engineer.

Cold plane asphalt concrete pavement will be measured by the square meter. The quantity to be paid for will be the actual area of surface cold planed irrespective of the number of passes required to obtain the depth shown on the plans.

The contract price paid per square meter for cold plane asphalt concrete pavement shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in cold planing asphalt concrete surfacing and disposing of planed material, including furnishing the asphalt concrete for and constructing, maintaining, removing, and disposing of temporary asphalt concrete tapers, as specified in the Standard Specifications and these special provisions and as directed by the Engineer.

### **BRIDGE REMOVAL**

Removing portions of bridges shall conform to the provisions in Section 15-4, "Bridge Removal," of the Standard Specifications and these special provisions.

The structure to be removed in stages as shown on the plans, is briefly described as follows:

#### **PUTAH CREEK BRIDGE**

Bridge No. 14-0014

A multiple span cast-in-place reinforced concrete tee-girder structure supported on pier walls and abutments on pile foundations.

All removed materials that are not to be salvaged or used in the reconstruction shall become the property of the Contractor and shall be disposed outside the highway right of way in conformance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

The Contractor shall submit a complete bridge removal plan to the Engineer detailing procedures and sequence for removing portions of bridge, including all features necessary to remove the bridges in a safe and controlled manner.

The bridge removal plan shall be furnished for Putah Creek Bridge, Bridge No. 14-0014, and shall include the following:

- A. The bridge removal sequence for the entire structure, including staging of bridge removal;
- B. Equipment locations on the structure during removal operations;
- C. Temporary support shoring or temporary bracing;
- D. Locations where work is to be performed over traffic or waterway; and
- E. Details and locations of protective covers or other measures to assure that people, property, and improvements will not be endangered.

Temporary support shoring, temporary bracing, and protective covers as required, shall be designed and constructed in conformance with the provisions in Section 51-1.06, "Falsework," of the Standard Specifications and these special provisions.

The assumed horizontal load to be resisted by the temporary support shoring and temporary bracing, for removal operations only, shall be the sum of the actual horizontal loads due to equipment, construction sequence or other causes, and an allowance for wind, but in no case shall the assumed horizontal load to be resisted in any direction be less than 5 percent of the total dead load of the structure to be removed.

The Contractor shall submit working drawings, with design calculations, to the Engineer for the proposed bridge removal plan. The bridge removal plan shall be prepared by an engineer who is registered as a Civil Engineer in the State of California. The design calculations shall be adequate to demonstrate the stability of the structure during all stages of the removal operations. Calculations shall be provided for each stage of bridge removal and shall include dead and live load values assumed in the design of protective covers. At a minimum, a stage will be considered to be removal of the deck, the soffit, or the girders, in any span; or walls, bent caps, or columns at support locations.

The bridge removal plan shall conform to the provisions in Section 5-1.02, "Plans and Working Drawings," of the Standard Specifications. The number of sets of drawings and design calculations and times for review for any bridge removal plans shall be the same as specified for falsework working drawings in Section 51-1.06A, "Falsework Design and Drawings," of the Standard Specifications.

The time to be provided for the Engineer's review of the working drawings for removing specific structures, or portions thereof, shall be as follows:

| Structure or Portion of Structure     | Review Time - Weeks |
|---------------------------------------|---------------------|
| Putah Creek Bridge,<br>Br No. 14-0014 | 4                   |

Prior to proceeding with bridge removal where a bridge removal plan is required, an engineer for the Contractor who is registered as a Civil Engineer in the State of California shall inspect the temporary support shoring, including temporary bracing and protective coverings, for conformity with the working drawings. The Contractor's registered engineer shall certify in writing that the temporary support shoring, including temporary bracing and protective coverings, substantially conform to the details on the working drawings, and that the material and workmanship are satisfactory for the purpose intended. A copy of this certification shall be available at the site of the work at all times.

At a bridge site where a bridge removal plan is required, the Contractor's registered engineer shall be present at all times when bridge removal operations are in progress. The Contractor's registered engineer shall inspect the bridge removal operation and report in writing on a daily basis the progress of the operation and the status of the remaining structure. A copy of the daily report shall be available at the site of the work at all times. Should an unplanned event occur, the Contractor's registered engineer shall submit immediately to the Engineer for approval, the procedure of operation proposed to correct or remedy the occurrence.

#### **10-1.21 CLEARING AND GRUBBING**

Clearing and grubbing shall conform to the provisions in Section 16, "Clearing and Grubbing," of the Standard Specifications and these special provisions.

Vegetation shall be cleared and grubbed only within the excavation and embankment slope lines.

At locations where there is no grading adjacent to a bridge or other structure, clearing and grubbing of vegetation shall be limited to 1.5 m outside the physical limits of the bridge or structure.

Existing vegetation outside the areas to be cleared and grubbed shall be protected from injury or damage resulting from the Contractor's operations.

Activities controlled by the Contractor, except cleanup or other required work, shall be confined within the graded areas of the roadway.

Nothing herein shall be construed as relieving the Contractor of the Contractor's responsibility for final cleanup of the highway as provided in Section 4-1.02, "Final Cleaning Up," of the Standard Specifications.

#### **10-1.22 EARTHWORK**

Earthwork shall conform to the provisions in Section 19, "Earthwork," of the Standard Specifications and these special provisions.

Surplus excavated material shall become the property of the Contractor and shall be disposed of outside the highway right of way in conformance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

Where a portion of the existing surfacing is to be removed, the outline of the area to be removed shall be cut on a neat line with a power-driven saw to a minimum depth of 50 mm before removing the surfacing. Full compensation for cutting the existing surfacing shall be considered as included in the contract price paid per cubic meter for roadway excavation and no additional compensation will be allowed therefor.

If the Contractor elects to use the "Weep Hole and Geocomposite Drain" alternative where permitted on the plans, the geocomposite drain shall conform to the details shown on the plans and the following:

- A. Attention is directed to "Engineering Fabrics" under "Materials" of these special provisions.
- B. Geocomposite drain shall consist of a manufactured core not less than 6.35 mm thick nor more than 50 mm thick with one or both sides covered with a layer of filter fabric that will provide a drainage void. The drain shall produce a flow rate, through the drainage void, of at least 25 liters per minute per meter of width at a hydraulic gradient of 1.0 and a minimum externally applied pressure of 168 kPa.
- C. A Certificate of Compliance conforming to the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications shall be furnished for the geocomposite drain certifying that the drain produces the required flow rate and complies with these special provisions. The Certificate of Compliance shall be accompanied by a flow capability graph for the geocomposite drain showing flow rates for externally applied pressures and hydraulic gradients. The flow capability graph shall be stamped with the verification of an independent testing laboratory.

- D. Filter fabric for the geocomposite drain shall conform to the provisions for fabric for underdrains in Section 88, "Engineering Fabrics," of the Standard Specifications.
- E. The manufactured core shall be either a preformed grid of embossed plastic, a mat of random shapes of plastic fibers, a drainage net consisting of a uniform pattern of polymeric strands forming 2 sets of continuous flow channels, or a system of plastic pillars and interconnections forming a semirigid mat.
- F. The core material and filter fabric shall be capable of maintaining the drainage void for the entire height of geocomposite drain. Filter fabric shall be integrally bonded to the side of the core material with the drainage void. Core material manufactured from impermeable plastic sheeting having nonconnecting corrugations shall be placed with the corrugations approximately perpendicular to the drainage collection system.
- G. The geocomposite drain shall be installed with the drainage void and the filter fabric facing the embankment. The fabric facing the embankment side shall overlap a minimum of 75 mm at all joints and wrap around the exterior edges a minimum of 75 mm beyond the exterior edge. If additional fabric is needed to provide overlap at joints and wrap-around at edges, the added fabric shall overlap the fabric on the geocomposite drain at least 150 mm and be attached thereto.
- H. Should the fabric on the geocomposite drain be torn or punctured, the damaged section shall be replaced completely or repaired by placing a piece of fabric that is large enough to cover the damaged area and provide a minimum 150-mm overlap.
- I. Plastic pipe shall conform to the provisions for edge drain pipe and edge drain outlets in Section 68-3, "Edge Drains," of the Standard Specifications.
- J. Treated permeable base to be placed around the slotted plastic pipe at the bottom of the geocomposite drain shall be cement treated permeable base conforming to the provisions for cement treated permeable base in Section 29, "Treated Permeable Bases," of the Standard Specifications and these special provisions.
- K. The treated permeable base shall be enclosed with a high density polyethylene sheet or PVC geomembrane, not less than 250  $\mu$ m thick, which is bonded with a suitable adhesive to the concrete and geocomposite drain. Surfaces to receive the polyethylene sheet shall be cleaned before applying the adhesive. The treated permeable base shall be compacted with a vibrating shoe type compactor.

#### **MEASUREMENT AND PAYMENT (EARTHWORK)**

Measurement and payment for earthwork shall conform to all provisions for "Measurement" and "Payment" in Section 19, "Earthwork," of the Standard Specifications and these special provisions.

Pervious backfill material in connection with bridge work will be measured and paid for by the cubic meter as structure backfill (bridge).

If structure excavation or structure backfill involved in bridges is not otherwise designated by type, and payment for the structure excavation or structure backfill has not otherwise been provided for in the Standard Specifications or these special provisions, the structure excavation or structure backfill will be paid for at the contract price per cubic meter for structure excavation (bridge) or structure backfill (bridge).

#### **10-1.23 EROSION CONTROL (TYPE D)**

Erosion control (Type D) shall conform to the provisions in Section 20-3, "Erosion Control," of the Standard Specifications and these special provisions.

Erosion control (Type D) work shall consist of applying erosion control materials to embankment and excavation slopes and other areas disturbed by construction activities. Erosion control (Type D) shall be applied during the period starting September 1 and ending October 1; or, if the slope on which the erosion control is to be placed is finished during the winter season as specified in "Water Pollution Control" of these special provisions, the erosion control shall be applied immediately; or, if the slope on which the erosion control is to be placed is finished outside both specified periods and the contract work will be completed before September 1, the erosion control shall be applied as a last item of work.

Prior to installing erosion control materials, soil surface preparation shall conform to the provisions in Section 19-2.05, "Slopes," of the Standard Specifications, except that rills and gullies exceeding 50 mm in depth or width shall be leveled. Vegetative growth, temporary erosion control materials and other debris shall be removed from areas to receive erosion control.

#### **MATERIALS**

Materials shall conform to the provisions in Section 20-2, "Materials," of the Standard Specifications and these special provisions.

##### **Seed**

Seed shall conform to the provisions in Section 20-2.10, "Seed," of the Standard Specifications. Individual seed species shall be measured and mixed in the presence of the Engineer.

Seed shall be delivered to the project site in unopened separate containers with the seed tag attached. Containers without a seed tag attached will not be accepted.

A sample of approximately 30 g of seed will be taken from each seed container by the Engineer.

### **Legume Seed**

Legume seed shall be pellet-inoculated or industrial-inoculated and shall conform to the following:

- A. Inoculated seed shall be inoculated in conformance with the provisions in Section 20-2.10, "Seed," of the Standard Specifications.
- B. Inoculated seed shall have a calcium carbonate coating.
- C. Industrial-inoculated seed shall be inoculated with Rhizobia and coated using an industrial process by a manufacturer whose principal business is seed coating and seed inoculation.
- D. Industrial-inoculated seed shall be sown within 180 calendar days after inoculation.
- E. Legume seed shall consist of the following:

#### **LEGUME SEED**

| Botanical Name<br>(Common Name)          | Percent Germination<br>(Minimum) | Kilograms Pure Live Seed Per Hectare<br>(Slope Measurement) |
|--|----------------------------------|---|
| Lupinus bicolor<br>(Pygmy-leaved Lupine) | 50                               | 8   |

### **Non-Legume Seed**

Non-legume seed shall consist of the following:

#### **NON-LEGUME SEED**

| Botanical Name<br>(Common Name)                         | Percent Germination<br>(Minimum) | Kilograms Pure Live Seed Per Hectare<br>(Slope Measurement) |
|---|----------------------------------|---|
| Eschscholzia California<br>(California Poppy)           | 50                               | 1   |
| Festuca ovina 'Bighorn Sheep'<br>(Bighorn Sheep Fescue) | 60                               | 5   |
| Phacelia campanularia<br>(California Blue Bells)        | 50                               | .5  |
| *Poa secunda secunda<br>(Pine Bluegrass)                | 40                               | 1   |
| Triticum x Agropyron<br>(Regreen)                       | 60                               | 50  |
| Vulpia microstachys<br>(Three Weeks Fescue)             | 60                               | 3   |

\* Native California Seed Source only.

### **Straw**

Straw shall conform to the provisions in Section 20-2.06, "Straw," of the Standard Specifications and these special provisions.

If wheat and barley straw is used, straw shall be derived from irrigated crops.

Prior to delivery of wheat or barley straw to the project site, the Contractor shall provide the date of harvest and the name, address and telephone number of the grower.

### **Compost**

Compost shall be derived from green material consisting of chipped, shredded or ground vegetation or clean processed recycled wood products or a Class A, exceptional quality biosolids composts, as required by the United States Environmental Protection Agency (EPA), 40 CFR, Part 503c regulations or a combination of green material and biosolids compost. The compost shall be processed or completed to reduce weed seeds, pathogens and deleterious material, and shall not contain paint, petroleum products, herbicides, fungicides or other chemical residues that would be harmful to plant or animal life. Other deleterious material, plastic, glass, metal or rocks shall not exceed 0.1 percent by weight or volume. A minimum internal temperature of 57°C shall be maintained for at least 15 continuous days during the composting process. The compost shall be thoroughly turned a minimum of 5 times during the composting process and shall go through a minimum 90-day

curing period after the 15-day thermophilic compost process has been completed. Compost shall be screened through a maximum 6 mm screen. The moisture content of the compost shall not exceed 35 percent. Moisture content shall be determined by California Test 226. Compost products with a higher moisture content may be used provided the weight of the compost is increased to equal the compost with a moisture content of 35 percent. Compost will be tested for maturity and stability with a slovita test kit. The compost shall measure a minimum of 6 on the maturity and stability scale.

### **Stabilizing Emulsion**

Stabilizing emulsion shall conform to the provisions in Section 20-2.11, "Stabilizing Emulsion," of the Standard Specifications and these special provisions. Stabilizing emulsion shall be nonflammable and shall have an effective life of at least one year.

Stabilizing emulsion shall be in a dry powder form, may be reemulsifiable, and shall be a processed organic adhesive used as a soil tackifier.

### **APPLICATION**

Erosion control materials shall be applied in 3 separate applications in the following sequence:

- A. The following mixture in the proportions indicated shall be applied with hydro-seeding equipment within 60 minutes after the seed has been added to the mixture:

| Material        | Kilograms Per Hectare<br>(Slope Measurement) |
|-----------------|--|
| Fiber           | 500  |
| Non-Legume Seed | 60.5   |
| Legume Seed     | 8  |
| Compost         | 1500   |

- B. Straw shall be applied at the rate of 4 tonnes per hectare based on slope measurements. Incorporation of straw will not be required.
- C. The following mixture in the proportions indicated shall be applied with hydro-seeding equipment:

| Material                      | Kilograms Per Hectare<br>(Slope Measurement) |
|-------------------------------|--|
| Fiber                         | 500  |
| Compost                       | 1500   |
| Commercial Fertilizer         | 250  |
| Stabilizing Emulsion (Solids) | 200  |

The ratio of total water to total stabilizing emulsion in the mixture shall be as recommended by the manufacturer.

Once straw work is started in an area, stabilizing emulsion applications shall be completed in that area on the same working day.

### **MEASUREMENT AND PAYMENT**

The contract price paid per kilogram for compost (erosion control) shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in applying compost for erosion control, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

#### **10-1.24 AGGREGATE BASE**

Aggregate base shall be Class 2 and shall conform to the provisions in Section 26, "Aggregate Bases," of the Standard Specifications and these special provisions.

The restriction that the amount of reclaimed material included in Class 2 aggregate base not exceed 50 percent of the total volume of the aggregate used shall not apply. Aggregate for Class 2 aggregate base may include reclaimed glass. Aggregate base incorporating reclaimed glass shall not be placed at locations where surfacing will not be placed over the aggregate base.

The Durability Index for Class 2 aggregate base shall be 25 minimum.

Aggregate base shall have a minimum weight of 2 270 kilograms per cubic meter.

#### 10-1.25 ASPHALT CONCRETE

Asphalt concrete shall be Type A or Open graded and shall conform to the provisions in Section 39, "Asphalt Concrete," of the Standard Specifications and these special provisions.

The grade of asphalt binder to be mixed with aggregate for Type A asphalt concrete shall be PBA Grade 1 and shall conform to the provisions in "Asphalt" of these special provisions.

The grade of asphalt binder to be mixed with aggregate for Open graded asphalt concrete shall be PBA Grade 1 and shall conform to the provisions in "Asphalt" of these special provisions.

The amount of asphalt binder used in asphalt concrete placed in dikes shall be increased one percent by mass of the aggregate over the amount of asphalt binder determined for use in asphalt concrete placed on the traveled way.

The aggregate for Type A asphalt concrete shall conform to the 19-mm maximum, medium grading specified in Section 39-2.02, "Aggregate," of the Standard Specifications.

The miscellaneous areas to be paid for at the contract price per square meter for place asphalt concrete (miscellaneous area), in addition to the prices paid for the materials involved, shall be limited to the areas listed on the plans.

Aggregate for asphalt concrete dikes shall be in conformance with the provisions for 9.5-mm Maximum grading in Section 39-2.02, "Aggregate," of the Standard Specifications.

If the Contractor selects the batch mixing method, asphalt concrete shall be produced by the automatic batch mixing method in conformance with the provisions in Section 39-3.03A(2), "Automatic Proportioning," of the Standard Specifications.

If the finished surface of the open graded asphalt concrete on Route 29 traffic lanes does not meet the specified surface tolerances, it shall be completely removed and replaced, unless otherwise directed by the Engineer. The corrective work shall be at the Contractor's expense.

Except for open graded asphalt concrete, in addition to the provisions listed in Section 39, "Asphalt Concrete," of the Standard Specifications, the asphalt concrete shall conform to the following quality requirement when mixed with the asphalt used on the job in the amount determined to be optimum by California Test 367:

| Test             | California Test | Requirement                             |
|------------------|-----------------|---|
| Surface Abrasion | 360             | Loss not to exceed 0.4g/cm <sup>2</sup> |

In addition to the provisions in Section 39-5.01, "Spreading Equipment," of the Standard Specifications, asphalt paving equipment shall be equipped with automatic screed controls and a sensing device or devices.

When placing asphalt concrete to the lines and grades established by the Engineer, the automatic controls shall control the longitudinal grade and transverse slope of the screed. Grade and slope references shall be furnished, installed, and maintained by the Contractor. Should the Contractor elect to use a ski device, the minimum length of the ski device shall be 9 m. The ski device shall be a rigid one piece unit and the entire length shall be utilized in activating the sensor.

When placing the initial mat of asphalt concrete on existing pavement, the end of the screed nearest the centerline shall be controlled by a sensor activated by a ski device not less than 9 m long. The end of the screed farthest from centerline shall be controlled by an automatic transverse slope device set to reproduce the cross slope designated by the Engineer.

When paving contiguously with previously placed mats, the end of the screed adjacent to the previously placed mat shall be controlled by a sensor that responds to the grade of the previously placed mat and will reproduce the grade in the new mat within a 3-mm tolerance. The end of the screed farthest from the previously placed mat shall be controlled in the same way it was controlled when placing the initial mat.

Should the methods and equipment furnished by the Contractor fail to produce a layer of asphalt concrete conforming to the provisions, including straightedge tolerance, of Section 39-6.03, "Compacting," of the Standard Specifications, the paving operations shall be discontinued and the Contractor shall modify the equipment or methods, or furnish substitute equipment.

Should the automatic screed controls fail to operate properly during a day's work, the Contractor may manually control the spreading equipment for the remainder of that day. However, the equipment shall be corrected or replaced with alternative automatically controlled equipment conforming to the provisions in this section before starting another day's work.

The area to which paint binder has been applied shall be closed to public traffic. Care shall be taken to avoid tracking binder material onto existing pavement surfaces beyond the limits of construction.

A drop-off of more than 45 mm will not be allowed at any time between adjacent lanes open to public traffic.

Where the existing pavement is to be widened by constructing a new structural section adjacent to the existing pavement, the new structural section, on both sides of the existing pavement, shall be completed to match the elevation of the edge of



the existing pavement at each location prior to spreading and compacting asphalt concrete over the adjacent existing pavement.

Asphalt concrete surfacing shall be placed on existing surfacing, including curve widening, , left turn lanes, and public and private road connections shown on the plans, unless otherwise directed by the Engineer.

Additional asphalt concrete surfacing material shall be placed along the edge of the surfacing at road connections and private drives, hand raked, if necessary, and compacted to form smooth tapered conforms. Full compensation for furnishing all labor and tools and for doing all the work necessary to hand rake these conforms shall be considered as included in the contract prices paid per tonne for the various contract items of asphalt concrete surfacing involved and no additional compensation will be allowed therefor.

#### **10-1.26 PILING**

Piling shall conform to the provisions in Section 49, "Piling," of the Standard Specifications, and these special provisions.

Foundation recommendations are included in the "Information Handout" available to the Contractor as provided for in Section 2-1.03, "Examination of Plans, Specifications, Contract, and Site of Work," of the Standard Specifications.

Attention is directed to "Welding Quality Control" of these special provisions.

Difficult pile installation is anticipated due to the presence of very dense soils containing frequent cobbles and occasional boulders, high ground water, and subsurface piling debris. Blow counts well in excess of counts required to obtain the specified bearing value are expected in order to reach the specified tip elevation.

#### **STEEL PIPE PILING**

##### **General**

Steel pipe piling shall consist of unfilled steel pipe piling, steel shells for open and closed ended cast-in-steel-shell concrete piling, and permanent steel casing for cast-in-drilled-hole concrete piling.

Wherever reference is made to the following American Petroleum Institute (API) specifications in the Standard Specifications, on the project plans, or in these special provisions, the year of adoption for these specifications shall be as follows:

| API Codes | Year of Adoption |
|-----------|------------------|
| API 2B    | 1990             |
| API 5L    | 1995             |

Only steel pipe pile seam welds may be made by the electric resistance welding method. Such welds shall be welded in conformance with the requirements in API 5L and any amendments to API 5L in the Standard Specifications or these special provisions.

Seams in steel pipe piles made by submerged arc welding may be welded in conformance with the requirements in API 5L and any amendments to API 5L in the Standard Specifications or these special provisions.

Handling devices may be attached to steel pipe piling. Welds attaching these devices shall be aligned parallel to the axis of the pile and shall conform to the requirements for field welding specified herein. Permanent bolted connections shall be corrosion resistant. Prior to making attachments, the Contractor shall submit a plan to the Engineer that includes the locations, handling and fitting device details, and connection details. Attachments shall not be made to the steel pipe piling until the plan is approved in writing by the Engineer. The Engineer shall have 7 days to review the plan. Should the Engineer fail to complete the review within 7 days, and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of the delay in reviewing the plan, the delay will be considered a right of way delay in conformance with the provisions in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

Each length of steel pipe piling shall be marked in conformance with the requirements in ASTM Designation: A 252.

For steel pipe piling, including bar reinforcement in the piling, the Engineer shall be allowed 48 hours to review the "Welding Report," specified in "Welding Quality Control" of these special provisions, and respond in writing after the required items have been received. No field welded steel pipe piling shall be installed, and no reinforcement in the piling shall be encased in concrete until the Engineer has approved the above requirements in writing. Should the Engineer fail to complete the review and provide notification within this time allowance, and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of the delay in notification, the delay will be considered a right of way delay in conformance with the provisions in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

At the Contractor's option, a steel pipe pile may be re-tapped to prevent pile set-up; however, the field welded splice shall remain at least one meter above the work platform until that splice is approved in writing by the Engineer.

### **Manufactured Steel Pipe**

Manufactured steel pipe is defined as pipe produced at a permanent facility where an automatic welding process, electric resistance welder, or seamless pipe operation is used in conformance with ASTM Designations: A 252, A 53, A 135, A 139, API 5L, or AWWA C200; where this steel pipe can be produced in lengths at least 9 m long without a circumferential splice; and where this manufacturing can be done on a daily basis. Manufactured steel pipe is not a specifically engineered product. (i.e. Manufactured steel pipe is an off-the-shelf item.)

Manufactured steel pipe used for steel pipe piling shall conform to the following requirements:

- A. The outside circumference of the steel pipe piling end shall not vary by more than 10 mm from that corresponding to the diameter shown on the plans.
- B. The maximum allowable misalignment for adjacent steel pipe pile edges to be welded shall be 0.1875 times the wall thickness, but not more than 1.6 mm.
- C. Steel pipe pile straightness shall conform to the requirements in API 5L, Section 7.6, "Straightness."
- D. Welds made at a permanent manufacturing facility shall be made by either an automatic welding process or an electric resistance welding process.

### **Fabricated Steel Pipe**

Fabricated steel pipe is defined as pipe produced at a permanent facility where a variety of steel fabrication including roll forming and welding steel plate into pipe is performed, where this pipe is at least 19 mm in wall thickness, where this pipe is produced in conformance with API 2B, and where this fabrication can be done on a daily basis. Fabricated steel pipe is a specifically engineered product. (i.e. Fabricated steel pipe is engineered for a specific project.)

Fabricated steel pipe used for steel pipe piling shall conform to API 2B and the following requirements:

- A. An API site license and API monogram are not required.
- B. Weld filler metal shall conform to the requirements of AWS D1.5 for the welding of ASTM Designation: A 709, Grade 50 steel, except that the qualification, pretest, and verification test requirements need not be conducted if certified test reports are provided for the consumables to be used.

### **Field Welding**

Field welding of steel piling is defined as welding performed after the certificate of compliance has been furnished by the manufacturer or fabricator and shall conform to the following requirements:

- A. Match marking of pipe ends at the manufacturing or fabrication facility is recommended for piling to ensure weld joint fit-up. Prior to positioning any 2 sections of steel pipe to be spliced by field welding, including those that have been match marked at the manufacturing or fabrication facility, the Contractor shall equalize the offsets of the pipe ends to be joined and match mark the pipe ends.
- B. Welds made in the flat position or vertical position (where the longitudinal pipe axis is horizontal) shall be single-vee groove welds. Welds made in the horizontal position (where the longitudinal pipe axis is vertical) shall be single-bevel groove welds. Joint fit-ups shall conform to the requirements for tubular sections in AWS D1.1 and these special provisions.
- C. The minimum thickness of the backing ring shall be 6 mm, and the ring shall be continuous. Splices in the backing ring shall be made by complete penetration welds. These welds shall be completed and inspected prior to final insertion into a pipe end. Attachment of backing rings to pipe ends shall be done using the minimum size and spacing of tack welds that will securely hold the backing ring in place. Tack welding shall be done in the root area of the weld splice. Cracked tack welds shall be removed and replaced prior to subsequent weld passes. The gap between the backing ring and the steel pipe piling wall shall be no greater than 2 mm. One localized portion of the splice, that is equal to or less than a length that is 20 percent of the outside circumference of the pipe, as determined by the Engineer, may be offset by a gap equal to or less than 6 mm provided that this localized portion is first seal welded using shielded metal arc E7016 or E7018 electrodes. The Contractor shall mark this localized portion so that it can be referenced during any required nondestructive testing (NDT). Backing rings shall have a minimum width of 1 1/2 times the thickness of the pile to be welded so that they will not interfere with the interpretation of the NDT.
- D. For steel pipe with an outside diameter greater than 1.1 m, and with a wall thickness greater than 25.4 mm, the root opening tolerances may be increased to a maximum of 5 mm over the specified tolerances.
- E. Weld filler metal shall conform to the requirements shown in AWS D1.5 for the welding of ASTM Designation: A 709, Grade 50 steel, except that the qualification, pretest, and verification test requirements need not be conducted if certified test reports are provided for the consumables to be used.
- F. For field welding, including attaching backing rings and making repairs, the preheat and interpass temperature shall be in conformance with AWS D1.1, Section 3.5, "Minimum Preheat and Interpass Temperature Requirements," and

with Table 3.2, Category C; and the minimum preheat and interpass temperature shall be 66°C, regardless of the pipe pile wall thickness or steel grade. In the event welding is disrupted, preheating to 66°C must occur before welding is resumed.

G. Welds shall not be water quenched. Welds shall be allowed to cool unassisted.

### OPEN ENDED CAST-IN-STEEL-SHELL CONCRETE PILING

Cast-in-steel-shell concrete piling shall consist of driven open ended steel shells filled with reinforced cast-in-place concrete and shall conform to the provisions in Section 49-4, "Cast-in-Place Concrete Piles," of the Standard Specifications and these special provisions.

In addition to driving, it is anticipated that drilling through the center of open ended steel shells to obtain the specified penetration may be necessary. The diameter of the drilled hole shall be less than the inside diameter of the piling. Equipment or methods used for drilling holes shall not cause quick soil conditions or cause scouring or caving of the hole. Drilling shall not be used within 6 meters above the specified tip elevation.

The piles shall be installed open ended and no internal plates shall be used.

### Materials

At the Contractor's option, the Contractor may use either the 12.5-mm maximum combined aggregate grading or the 9.5-mm maximum combined aggregate grading. The grading requirements for the 12.5-mm maximum coarse aggregate and the 9.5-mm maximum coarse aggregate are shown in the following table:

| Sieve Sizes | Percentage Passing<br>Primary Aggregate Nominal Size |                     |                  |                     |
|-------------|--|---------------------|------------------|---------------------|
|             | 12.5 mm x 4.75 mm                                    |                     | 9.5 mm x 2.36 mm |                     |
|             | Operating Range                                      | Contract Compliance | Operating Range  | Contract Compliance |
| 19 mm       | 100  | 100                 |                  |                     |
| 12.5 mm     | 82 - 100   | 80 - 100            | 100              |                     |
| 9.5 mm      | X ± 15   | X ± 22              | X ± 15           | X ± 20              |
| 4.75 mm     | 0 - 15   | 0 - 18              | 0 - 25           | 0 - 28              |
| 2.36 mm     | 0 - 6  | 0 - 7               | 0 - 6            | 0 - 7               |

In the table above, the symbol X is the gradation which the Contractor proposes to furnish for the 9.5-mm sieve size.

The gradation proposed by the Contractor for the 12.5-mm x 4.75-mm primary aggregate or for the 9.5-mm x 2.36-mm primary aggregate shall be within the following percentage passing limits:

| Primary Aggregate Nominal Size | Sieve Sizes | Limits of Proposed Gradation |
|--------------------------------|-------------|------------------------------|
| 12.5 mm x 4.75 mm              | 9.5 mm      | 40 - 78                      |
| 9.5 mm x 2.36 mm               | 9.5 mm      | 50 - 85                      |

The combined aggregate grading for the 12.5-mm x 4.75-mm primary aggregate nominal size or for the 9.5-mm x 2.36-mm primary aggregate nominal size shall be within the following limits:

| Grading Limits of Combined Aggregate |                    |             |
|--------------------------------------|--------------------|-------------|
| Sieve Sizes                          | Percentage Passing |             |
|                                      | 12.5-mm Max.       | 9.5-mm Max. |
| 19 mm                                | 100                | 100         |
| 12.5 mm                              | 90 - 100           | 90 - 100    |
| 9.5 mm                               | 55 - 86            | 55 - 86     |
| 4.75 mm                              | 45 - 63            | 45 - 63     |
| 2.36 mm                              | 35 - 49            | 35 - 49     |
| 1.18 mm                              | 25 - 37            | 25 - 37     |
| 600 µm                               | 15 - 25            | 15 - 25     |
| 300 µm                               | 5 - 15             | 5 - 15      |
| 150 µm                               | 1 - 8              | 1 - 8       |
| 75 µm                                | 0 - 4              | 0 - 4       |

### Construction

The Contractor shall submit to the Engineer for approval, a cleanout method for open ended cast-in-steel-shell concrete piling. Care shall be taken during cleaning out of open ended steel shells to prevent disturbing the foundation material surrounding the pile. The bottom 3 meters of the pile shall not be cleaned out. Equipment or methods used for cleaning out steel shells shall not cause quick soil conditions or cause scouring or caving around or below the piles. The Contractor shall maintain a positive hydrostatic pressure during placement of seal course. Open ended steel shells shall be free of any soil, rock or other material deleterious to the bond between concrete and steel prior to placing reinforcement and concrete.

After the steel shells have been cleaned out, the pile shall be constructed expeditiously in order to prevent deterioration of the surrounding foundation material from the presence of water. Deteriorated foundation materials, including materials that have softened, swollen or degraded, shall be removed from the bottom of the steel shells and shall be disposed of.

Material resulting from cleaning out the steel shells shall be disposed of in conformance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications, unless otherwise specified or permitted by the Engineer.

Reinforcement shall be placed and secured symmetrically about the axis of the pile and shall be securely blocked to clear the sides of the steel shell.

If conditions render it impossible or inadvisable in the opinion of the Engineer to dewater the open ended cast-in-steel-shell concrete piling prior to placing reinforcement and concrete, then the bottom of the shell shall be sealed in conformance with the provisions in Section 51-1.10, "Concrete Deposited Under Water," of the Standard Specifications. The sealed shell shall then be dewatered and cleaned out as specified herein.

Steel pipe piling shall consist of unfilled steel pipe piling, steel shells for open and closed ended cast-in-steel-shell concrete piling, and permanent steel casing for cast-in-drilled-hole concrete piling and shall receive nondestructive testing (NDT) in conformance with these special provisions.

### Nondestructive Testing of Welds made at a Manufacturing or Fabrication Facility

Twenty-five percent of each longitudinal, circumferential, or spiral weld made at a permanent manufacturing or fabrication facility shall receive NDT. If repairs are required in a portion of the weld, additional NDT shall be performed. The additional NDT shall be made on both sides of the repair for a length equal to 10 percent of the length of the pipe outside circumference. After the additional NDT is performed, and if more repairs are required that have a cumulative weld length equal to or more than 10 percent of the length of the pipe outside circumference, then the entire weld shall receive NDT.

Circumferential or spiral welds shall receive NDT by either radiographic, radiosopic, real time imaging systems, or ultrasonic methods that are in conformance with the requirements in AWS D1.1. When a radiosopic or real time imaging method is used for inspection of these welds, the fluoroscope shall be evaluated in conformance with the requirements in API 5L, Section 9.7.3.8, "Procedure for Evaluating In-Motion Operation of a Fluoroscope."

At the option of the Contractor, seam welds made by the submerged arc welding process may receive NDT in conformance with the requirements in API 5L or in AWS D1.1.

The acceptance and repair criteria for NDT performed in conformance with the requirements in AWS D1.1 shall conform to the requirements in Section 6 of that code, for cyclically loaded nontubular connections subject to tensile stress.

Welds made by electric resistance welding shall receive ultrasonic testing (UT) in conformance with the requirements in API 5L.

When radiological inspection is performed in conformance with the requirements in API 5L, the testing shall also conform to the following additional provisions:

- A. Image quality indicators (IQI) shall conform to AWS D1.1, Section 6.17.1.
- B. IQI placement shall conform to AWS D1.1, Section 6.35.5.
- C. IQIs shall be positioned on the base metal.
- D. Procedures shall be qualified in conformance with the requirements in AWS D1.1, Section 6.35.3.
- E. Personnel shall be qualified in conformance with the requirements in AWS D1.1, Section 6.35.4.
- F. Film radiography shall be performed in conformance with the requirements in AWS D1.1, Section 6, Part E.

When UT is performed in conformance with the requirements in API 5L, the testing shall also conform to the following additional provisions:

- A. For electric resistance welds, the acceptance limits of Section 9.7.4.3 shall be based on only a type V10 notch or a type P notch at 10% t or less.
- B. For seam welds made by the submerged arc welding process, the acceptance limits of Section 9.7.4.3 shall be based on only a type N5 notch. Reinspection of indicated imperfections by film radiological methods will not be allowed.
- C. The ultrasonic instrument shall be suitable for use with transducers oscillating at frequencies between 2.25 and 5 megahertz.

### **Nondestructive Testing of Field Welds**

Personnel performing ultrasonic testing (UT) for field welds will be required to verify their qualifications prior to performing nondestructive testing by both written and practical exams. Information regarding these exams is available at the Transportation Laboratory.

At the option of the Contractor, either ultrasonic testing (UT) or radiographic testing (RT) shall be used as the method of NDT for splices made by field welding steel pipe piling. This NDT shall be used for each field weld, including welds that are made onto a portion of the steel pipe piling that has been installed and any repair made to a splice weld. Testing shall be done at locations selected by the Engineer. The length of a splice weld, not including repairs, where NDT is to be performed, shall have a cumulative weld length that is equal to 25 percent of the pipe outside circumference. The Engineer may select several locations on a given splice for NDT. The cover pass shall be ground smooth at the locations to be tested. The acceptance criteria shall conform to the requirements of AWS D1.1, Section 6, for cyclically loaded nontubular connections subject to tensile stress. If repairs are required in a portion of the weld, additional NDT shall be performed. The additional NDT shall be made on both sides of the repair for a length equal to 10 percent of the length of the pipe outside circumference. After the additional NDT is performed, and if more repairs are required that have a cumulative weld length equal to or more than 10 percent of the length of the pipe outside circumference, then the entire splice weld shall be ultrasonically tested.

Radiographic, magnetic particle, or ultrasonic testing shall be used to assure soundness of backing rings in conformance with the requirements in AWS D1.1, Section 6.

### **LOAD TEST PILES**

The Contractor shall notify the Engineer, in writing, not less than 10 days in advance of drilling or driving the piles to be load tested.

Before the piles are drilled, cast, cut to length or driven, load testing of each load test pile shown on the plans shall be completed:

The bottom of footing excavation shall be dewatered and made level before pile load testing. The excavation shall be kept dewatered during load testing.

Unless otherwise specified or shown on the plans, steel plates welded to the load test and anchor piling shall conform to the requirements in ASTM Designation: A 709/A 709M, Grade 36, and shall be welded to the piling in conformance with the requirements in AWS D1.1.

Pipe, couplings and fittings shall be commercially available materials of the types and ratings shown on the plans.

Extensometer conduit shall be installed on straight alignment and at the location shown on the plans. The conduit shall be blocked and tied to the reinforcement to prevent displacement of the conduit while placing pile concrete. The spacing of conduit blocking and ties shall not exceed 2 m.

### **DYNAMIC MONITORING**

Driven test piles and anchor piles will be monitored during the final 8 m of driving for dynamic response to the driving equipment. Monitoring will be done by State forces using State-furnished dynamic pile analyzer monitoring instruments.

The first pile driven at each bent location shall receive dynamic monitoring. Piles to be dynamically monitored shall be made available to State forces 2 working days prior to driving. The piles shall be safely supported a minimum of 150 mm off

the ground in a horizontal position on at least 2 support blocks. The pile shall be positioned so that State forces have safe access to the entire pile length and circumference for the installation of anchorages and control marks for monitoring. The Contractor shall rotate the piles on the blocks as directed by the Engineer.

At least 3.4 m of pile length at the top of pile shall be available on the piles utilized for Pile Dynamic Analysis (PDA) when the PDA pile has reached specified tip.

Piles to be dynamically monitored shall be prepared and driven in the following sequence:

- A. Prior to driving, the Contractor shall rotate and align the pile in the driving leads as directed by the Engineer
- B. The Contractor shall temporarily suspend driving operations for approximately 15 minutes when the pile tip is 8 m above the elevation to which the tip is required to be finally driven.
- C. During the 15 minute suspension, the Contractor shall bolt the 0.5-kg instrument package securely to plugs or expansion anchors previously installed in the pile by the State. The Contractor shall connect electrical cables to the instrument package as directed by the Engineer.
- D. Driving operations shall resume as directed by the Engineer. Driving operations shall be suspended approximately 0.5-m above the required tip elevation, as directed by the Engineer.
- E. The Contractor shall remove the cables and instrument package from the pile and deliver them to the Engineer.
- F. The following work day, the Contractor shall install the instrument package on the pile and attach the cables and resume driving the pile to the required tip elevation, as directed by the Engineer.
- G. The Contractor shall remove the cables and instruments from the monitored pile and deliver them to the Engineer.

The Contractor shall be responsible for damage to the State's cables and instruments caused by the Contractor's operations, and shall replace damaged cables or instruments in kind.

### **WAVE EQUATION**

The second paragraph of Section 49-1.03, "Determination of Length," and paragraphs 3 and 4 of Section 49-1.08, "Bearing Value and Penetration," of the Standard Specifications shall not apply to the pile types at the control locations listed herein. The Engineer will conduct a penetration and bearing analysis in conjunction with pile load testing and dynamic monitoring of the piles at these locations and develop bearing acceptance criteria curves for these piles. Penetration and bearing analyses will be based on a wave equation analysis.

The Engineer shall be allowed 27 working days to perform the load test, complete dynamic monitoring, revise specified tip elevations, and to provide the bearing acceptance criteria curves for a given control location. Day one of 27 shall be the first day after the load test and anchor piles have been installed at that same control location.

Should the Engineer fail to provide the bearing acceptance criteria curves for production piles within the time specified and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of the delay in providing the bearing acceptance criteria curves, the delay will be considered a right of way delay in conformance with the provisions in Section 8-1.09, "Right of Way Delays," of the Standard Specifications. Production piles, other than load test and anchor piles, shall not be installed until the bearing acceptance criteria curves for piles within the corresponding control location have been provided by the Engineer.

### **MEASUREMENT AND PAYMENT (PILING)**

Measurement and payment for the various types and classes of piles shall conform to the provisions in Sections 49-6.01, "Measurement," and 49-6.02, "Payment," of the Standard Specifications and these special provisions.

The first paragraph of Section 49-6.02, "Payment," of the Standard Specifications is amended to read:

- Timber, steel, and precast prestressed concrete piles, and cast-in-place concrete piles consisting of driven shells filled with concrete, will be paid for at the contract price per meter for furnish piling and the contract unit price for drive pile.

Payment for cast-in-place concrete piling shall conform to the provisions in Section 49-6.02, "Payment," of the Standard Specifications except that, when the diameter of cast-in-place concrete piling is shown on the plans as 600-mm or larger, reinforcement in the piling will be paid for by the kilogram as bar reinforcing steel (bridge).

Full compensation for furnishing and placing additional testing reinforcement, load test anchorages, and for cutting off test piles as specified, shall be considered as included in the contract price paid for piling of the type or class shown in the Engineer's Estimate, and no additional compensation will be allowed.

No additional compensation or extension of time will be made for additional foundation investigation, installation and testing of indicator piling, cutting off piling and restoring the foundation investigation and indicator pile sites, and review of request by the Engineer.

The seventh paragraph of Section 49-6.02, "Payment," of the Standard Specifications is amended to read:

- The contract unit price paid for drive pile shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in driving timber, concrete, and steel piles, driving steel shells for cast-in-place concrete piles, placing filling materials for cast-in-place concrete piles, and cutting off piles, all complete in place to the required bearing and penetration as shown on the plans, as specified in these specifications and the special provisions, and as directed by the Engineer.

Full compensation for cleaning out the open ended steel shells prior to installing reinforcement and filling with concrete, for disposing of materials removed from the inside of the pile, and for placing seal course concrete and dewatering the open ended steel shells, as shown on the plans, as specified in these special provisions, and as directed by the Engineer, shall be considered as included in the contract unit price paid for drive pile, and no additional compensation will be allowed therefor.

Full compensation for conforming to the provisions in "Steel Pipe Piling" and "Nondestructive Testing" of these special provisions shall be considered as included in the contract prices paid for the various items of work involved, and no additional compensation will be allowed therefor.

Full compensation for redriving monitored piles, for providing access for the Engineer, for dewatering during monitoring, and for installing and removing the instruments from the pile, shall be considered as included in the contract unit price paid for drive pile, and no separate payment will be made therefor. The length of piling to be paid for as furnish piling of the classes listed in the Engineer's Estimate shall include the lengths that monitored piles are redriven.

Isolation casing for load test piles will be measured and paid for as miscellaneous metal (bridge).

### **10-1.27 CONCRETE STRUCTURES**

Portland cement concrete structures shall conform to the provisions in Section 51, "Concrete Structures," of the Standard Specifications and these special provisions.

Shotcrete shall not be used as an alternative construction method for reinforced concrete members unless otherwise specified.

Neoprene strip shall be furnished and installed at abutment backwall joint protection at Putah Creek Bridge, Bridge No. 14-0014, in conformance with the details shown on the plans, the provisions in the Standard Specifications, and these special provisions.

Furnishing and installing neoprene strip shall conform to the requirements for strip waterstops as provided in Section 51-1.145, "Strip Waterstops," of the Standard Specifications, except that the protective board will not be required.

Materials for access opening covers in soffits of new cast-in-place concrete box girder bridges shall conform to the provisions for materials in Section 75-1.03, "Miscellaneous Bridge Metal," of the Standard Specifications.

The concrete shall be finished in conformance with the provisions for finishing surfaces in Section 73-1.06, "Sidewalk, Gutter Depression, Island Paving, Curb Ramp (Wheelchair Ramp), and Driveway Construction," except that surfaces shall not be marked.

### **FALSEWORK**

Falsework shall be designed and constructed in conformance with the requirements in Section 51-1.06, "Falsework," of the Standard Specifications and these special provisions.

The first paragraph of Section 51-1.06A, "Falsework Design and Drawings," of the Standard Specifications is amended to read:

#### **51-1.06A Falsework Design and Drawings**

- The Contractor shall submit to the Engineer working drawings and design calculations for falsework proposed for use at bridges. For bridges where the height of any portion of the falsework, as measured from the ground line to the soffit of the superstructure, exceeds 4.25 m; where any individual falsework clear span length exceeds 4.85 m; or where provision for vehicular, pedestrian, or railroad traffic through the falsework is made; the drawings shall be signed by an engineer who is registered as a Civil Engineer in the State of California. Six sets of the working drawings and 2 copies of the design calculations shall be furnished. Additional working drawings and design calculations shall be submitted when specified in "Railroad Relations and Insurance" of the special provisions.

In addition to the provisions in Section 51-1.06A, "Falsework Design and Drawings," of the Standard Specifications, the time to be provided for the Engineer's review of the working drawings for specific structures, or portions thereof, shall be as follows:

| Structure or Portion of Structure        | Review Time - Weeks |
|--|---------------------|
| Putah Creek Bridge<br>Bridge No. 14-0014 | 4                   |
|  |                     |

The table in the second paragraph of Section 51-1.06A(2), "Design Stresses, Loadings, and Deflections," of the Standard Specifications is amended to read:

**Timber:**

|   |   |
|---|---|
| Compression perpendicular to the grain  | 3.1 MPa   |
| Compression parallel to the grain       | $3310 \div (L/d)^2$ MPa; not to exceed 11 MPa                                   |
| Flexural stress                         | 12.4 MPa; 10.3 MPa for members with a nominal depth of 205 mm or less.          |
| Horizontal shear                        | 1.0 MPa   |
| Axial tension                           | 8.3 MPa   |
| Deflection due to concrete loading only | 0.0042 of the span, irrespective of deflection compensated for by camber strips |
| Modulus of elasticity (E)               | $11 \times 10^3$ MPa  |
| Timber piles                            | 400 kN  |

L = unsupported length

d = least dimension of a square or rectangular column, or the width of a square of equivalent cross-sectional area for round columns.

The first sentence in the ninth paragraph of Section 51-1.06A(2), "Design Stresses, Loadings, and Deflections," of the Standard Specifications is amended to read:

- The maximum loadings and deflections used on jacks, brackets, columns, joists and other manufactured devices shall not exceed the manufacturer's recommendations except that the dead load deflection of the joists used at locations other than under deck slabs between girders shall not exceed 0.0042 of their spans.

The third sentence in the first paragraph of Section 51-1.06B, "Falsework Construction," of the Standard Specifications is amended to read:

- When manufactured assemblies are used in falsework, the Contractor shall furnish to the Engineer a letter of certification which certifies that all components of these manufactured assemblies are used in conformance with the manufacturer's recommendations.

The third paragraph of Section 51-1.06B, "Falsework Construction," of the Standard Specifications is amended to read:

- When falsework is supported on piles, the piles shall be driven and the actual bearing value assessed in conformance with the provisions in Section 49, "Piling."
- For falsework piles with a calculated loading capacity greater than 900 kN, the Contractor shall conduct dynamic monitoring of pile driving and conduct penetration and bearing analyses based on a wave equation analysis. These analyses shall be signed by an engineer who is registered as a Civil Engineer in the State of California and submitted to the Engineer prior to completion of falsework erection.

Temporary crash cushion modules, as shown on the plans and conforming to the provisions in "Temporary Crash Cushion Module" of these special provisions, shall be installed at the approach end of temporary railings which are located less than 4.6 m from the edge of a traffic lane. For 2-way traffic openings, temporary crash cushion modules shall be installed at the departing end of temporary railings which are located less than 1.8 m from edge of a traffic lane.

**DECK CLOSURE POURS**

Where a deck closure pour is shown on the plans, reinforcement protruding into the closure space and forms for the closure pour shall conform to the following:

- During the time of placement of concrete in the deck, other than for the closure pour itself, reinforcing steel which protrudes into the closure space shall be completely free from any connection to the reinforcing steel, concrete, or



other attachments of the adjacent structure, including forms. The reinforcing steel shall remain free of any connection for a period of not less than 24 hours following completion of the pour.

B. Forms for the closure pour shall be supported from the superstructure on both sides of the closure space.

### **ELASTOMERIC BEARING PADS**

Elastomeric bearing pads shall conform to the provisions in Section 51-1.12H, "Elastomeric Bearing Pads," of the Standard Specifications and these special provisions.

The table in the ninth paragraph of Section 51-1.12H(1), "Plain and Fabric Reinforced Elastomeric Bearing Pads," of the Standard Specifications is amended to read:

|                              |  |
|------------------------------|--|
| Tensile strength, percent    | -15  |
| Elongation at break, percent | -40; but not less than 300% total elongation of the material |
| Hardness, points             | +10  |

### **MEASUREMENT AND PAYMENT**

Measurement and payment for concrete in structures shall conform to the provisions in Section 51-1.22, "Measurement," and Section 51-1.23, "Payment," of the Standard Specifications and these special provisions.

10-1.28 STRUCTURE APPROACH SLABS (Type N) This work shall consist of constructing reinforced concrete approach slabs, sleeper slabs, structure approach drainage system, and treated permeable base at structure approaches in conformance with the details shown on the plans, the provisions in Section 51, "Concrete Structures," of the Standard Specifications, and these special provisions.

### **GENERAL**

Attention is directed to the section "Engineering Fabrics" of these special provisions.

### **STRUCTURE APPROACH DRAINAGE SYSTEM**

#### **Geocomposite Drain**

Geocomposite drain shall consist of a manufactured core not less than 6.35 mm thick nor more than 50 mm thick with one or both sides covered with a layer of filter fabric that will provide a drainage void. The drain shall produce a flow rate, through the drainage void, of at least 25 liters per minute per meter of width at a hydraulic gradient of 1.0 and a minimum externally applied pressure of 168 kPa. A Certificate of Compliance conforming to the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications shall be furnished for the geocomposite drain certifying that the drain produces the required flow rate and complies with these special provisions. The Certificate of Compliance shall be accompanied by a flow capability graph for the geocomposite drain showing flow rates and the externally applied pressures and hydraulic gradients. The flow capability graph shall be stamped with the verification of an independent testing laboratory.

Filter fabric for the geocomposite drain shall conform to the provisions for fabric for underdrains in Section 88, "Engineering Fabrics," of the Standard Specifications.

The manufactured core shall be either a preformed grid of embossed plastic, a mat of random shapes of plastic fibers, a drainage net consisting of a uniform pattern of polymeric strands forming 2 sets of continuous flow channels, or a system of plastic pillars and interconnections forming a semirigid mat.

The core material and filter fabric shall be capable of maintaining the drainage void for the entire height of geocomposite drain. Filter fabric shall be integrally bonded to the side of the core material with the drainage void. Core material manufactured from impermeable plastic sheeting having nonconnecting corrugations shall be placed with the corrugations approximately perpendicular to the drainage collection system.

The geocomposite drain shall be installed with the drainage void and the filter fabric facing the embankment. The fabric facing the embankment side shall overlap a minimum of 75 mm at all joints and wrap around the exterior edges a minimum of 75 mm beyond the exterior edge. If additional fabric is needed to provide overlap at joints and wrap-around at edges, the added fabric shall overlap the fabric on the geocomposite drain at least 150 mm and be attached thereto.

Should the fabric on the geocomposite drain be torn or punctured, the damaged section shall be replaced completely or repaired by placing a piece of fabric that is large enough to cover the damaged area and provide a 150-mm overlap.

### **Plastic Pipe**

Plastic pipe shall conform to the provisions for pipe for edge drains and edge drain outlets in Section 68-3, "Edge Drains," of the Standard Specifications.

### **Treated Permeable Base At Bottom Of Geocomposite Drains**

Treated permeable base to be placed around the slotted plastic pipe at the bottom of geocomposite drains shall conform to the provisions in "Treated Permeable Base Under Approach Slabs." If asphalt treated permeable base is used, it shall be placed at a temperature of not less than 82°C nor more than 110°C.

The filter fabric to be placed over the treated permeable base at the bottom of geocomposite drains shall conform to the provisions for filter fabric for edge drains in Section 88, "Engineering Fabrics," of the Standard Specifications.

### **ENGINEERING FABRICS**

Filter fabric to be placed between the structure approach embankment material and the treated permeable base shall conform to the provisions for filter fabric for edge drains in Section 88, "Engineering Fabrics," of the Standard Specifications and these special provisions.

The subgrade to receive the filter fabric, immediately prior to placing, shall conform to the compaction and elevation tolerance specified for the material involved.

Filter fabric shall be aligned, handled, and placed in a wrinkle-free manner in conformance with the manufacturer's recommendations.

Adjacent borders of the filter fabric shall be overlapped from 300 to 450 mm or stitched. The preceding roll shall overlap the following roll in the direction the material is being spread or shall be stitched. When the fabric is joined by stitching, it shall be stitched with yarn of a contrasting color. The size and composition of the yarn shall be as recommended by the fabric manufacturer. The stitches shall number 5 to 7 per 25 mm of seam.

Equipment or vehicles shall not be operated or driven directly on the filter fabric.

Woven tape fabric shall be treated to provide a minimum of 70 percent breaking strength retention after 500 hours exposure when tested in conformance with the requirements in ASTM Designation: D 4355. The Contractor shall notify the Engineer, in writing, of the source of woven tape fabric at least 45 days prior to use.

### **TREATED PERMEABLE BASE UNDER APPROACH SLAB**

Treated permeable base under structure approach slabs shall consist of constructing either an asphalt treated permeable base or a cement treated permeable base in accordance with Section 29, "Treated Permeable Bases," of the Standard Specifications and these special provisions.

The type of treatment, asphalt or cement, to be used shall be at the option of the Contractor.

Not less than 30 days prior to the start of placing the treated permeable base, the Contractor shall notify the Engineer, in writing, which type of treated permeable base will be furnished. Once the Contractor has notified the Engineer of the selection, the type to be furnished shall not be changed without a prior written request to do so and approval thereof in writing by the Engineer.

Asphalt treated permeable base shall be placed at a temperature of not less than 93°C nor more than 121°C. Material stored in excess of 2 hours shall not be used in the work.

Asphalt treated permeable base material may be spread in one layer. The base material shall be compacted with a vibrating shoe type compactor or rolled with a roller weighing not less than 1.3 tonnes nor more than 4.5 tonnes. Rolling shall begin as soon as the mixture has cooled sufficiently to support the weight of the rolling equipment without undue displacement.

Cement treated permeable base material may be spread in one layer. The base material shall be compacted with either a vibrating shoe type compactor or with a steel-drum roller weighing not less than 1.3 tonnes nor more than 4.5 tonnes. Compaction shall follow within one-half hour after the spreading operation and shall consist of 2-complete coverages of the treated material.

### **APPROACH SLABS**

Concrete for use in approach slabs and sleeper slabs shall contain not less than 400 kilograms of cement per cubic meter.

Miscellaneous steel parts and all steel components of abutment ties including plates, nuts, washers, and rods shall conform to the provisions in Section 75-1.03, "Miscellaneous Bridge Metal," of the Standard Specifications. Bar reinforcement that has an unbonded portion shall be galvanized in conformance with the provisions in Section 75-1.05, "Galvanizing," of the Standard Specifications.

Structure approach slabs shall be cured for not less than 5 days prior to opening to public traffic, unless, at the option of the Contractor, the structure approach slabs are constructed using concrete with a non-chloride Type C chemical admixture conforming to these special provisions.

Portland cement for use in concrete using a non-chloride Type C chemical admixture shall be Type II Modified, Type II Prestress, or Type III. Type II Modified and Type III cement shall conform to the provisions in Section 90-2.01, "Portland Cement," of the Standard Specifications. Type II Prestress cement shall conform to the requirements of Type II Modified cement, except the mortar containing the portland cement to be used and Ottawa sand, when tested in conformance with California Test 527, shall not contract in air more than 0.053-percent.

The non-chloride Type C chemical admixture, approved by the Engineer, shall conform to the requirements in ASTM Designation: C 494 and Section 90-4, "Admixtures," of the Standard Specifications.

The concrete with non-chloride Type C chemical admixture shall be prequalified prior to placement in conformance with the provisions for prequalification of concrete specified by compressive strength in Section 90-9.01, "General," of the Standard Specifications and the following:

- A. Immediately after fabrication of the 5 test cylinders, the cylinders shall be stored in a temperature medium of  $21 \pm 1.5^{\circ}\text{C}$  until the cylinders are tested.
- B. The 6-hour average strength of the 5 test cylinders shall not be less than 5.85 MPa. No more than 2 test cylinders shall have a strength of less than 5.5 MPa.

The top surface of approach slabs shall be finished in conformance with the provisions in Section 51-1.17, "Finishing Bridge Decks," of the Standard Specifications. Edges of slabs shall be edger finished.

Approach slabs shall be cured with pigmented curing compound (1) in conformance with the provisions for curing structures in Section 90-7.01B, "Curing Compound Method," of the Standard Specifications.

Structure approach slabs constructed using concrete with a non-chloride Type C chemical admixture shall be cured for not less than 6 hours prior to opening to public traffic. The curing period shall be considered to begin at the start of discharge of the last truck load of concrete to be used in the slab.

If the ambient temperature is below  $18^{\circ}\text{C}$  during the curing period for approach slabs and sleeper slabs using concrete with a non-chloride Type C chemical admixture, an insulating layer or blanket shall cover the surface. The insulation layer or blanket shall have an R-value rating given in the table below. At the Contractor's option, a heating tent may be used in lieu of or in combination with the insulating layer or blanket.

| Temperature range during curing period       | R-value, minimum |
|--|------------------|
| $13^{\circ}\text{C}$ to $18^{\circ}\text{C}$ | 1                |
| $7^{\circ}\text{C}$ to $13^{\circ}\text{C}$  | 2                |
| $4^{\circ}\text{C}$ to $7^{\circ}\text{C}$   | 3                |

## JOINTS

Hardboard and expanded polystyrene shall conform to the provisions in Section 51-1.12D, "Sheet Packing, Preformed Pads and Board Fillers," of the Standard Specifications.

Type AL joint seals shall conform to the provisions in Section 51-1.12F, "Sealed Joints" of the Standard Specifications. The sealant may be mixed by hand-held power-driven agitators and placed by hand methods.

The pourable seal between the steel angle and concrete barrier shall conform to the requirements for Type A and AL seals in Section 51-1.12F(3), "Materials and Installation," of the Standard Specifications. The sealant may be mixed by hand-held power-driven agitators and placed by hand methods. Immediately prior to placing the seal, the joint shall be thoroughly cleaned, including abrasive blast cleaning of the concrete surfaces, so that all foreign material and concrete spillage are removed from all joint surfaces. Joint surfaces shall be dry at the time the seal is placed.

## MEASUREMENT AND PAYMENT

Structural concrete, approach slab (Type N) will be measured and paid for in conformance with the provisions in Section 51-1.22, "Measurement," and Section 51-1.23, "Payment," of the Standard Specifications and these special provisions.

Full compensation for the structure approach drainage system including geocomposite drain, plastic pipe, treated permeable base, and filter fabric shall be considered as included in the contract price paid per cubic meter for structural concrete, approach slab of the type shown in the Engineer's Estimate and no additional compensation will be allowed therefor.

### **10-1.29 SEALING JOINTS**

Joints in concrete bridge decks and joints between concrete structures and concrete approach slabs shall be sealed in conformance with the details shown on the plans, the provisions in Section 51, "Concrete Structures," of the Standard Specifications, and these special provisions.

Where polyurethane seals are shown on the plans, a silicone sealant conforming to the provisions in Section 51-1.12F, "Sealed Joints," of the Standard Specifications may be used.

When ordered by the Engineer, a joint seal larger than called for by the Movement Rating shown on the plans shall be furnished and installed. Payment to the Contractor for furnishing the larger seal and for saw cutting the increment of additional depth of groove required will be determined as provided in Section 4-1.03, "Changes," of the Standard Specifications.

For Type A and Type AL seals, a pourable 2-component polyurethane or silicone sealant that meets the test requirements in Section 51-1.12F(3), "Materials and Installation," of the Standard Specifications and also has a minimum pot life of 10 minutes at a temperature of 32°C may be used, at the option of the Contractor. The 2 components of polyurethane or silicone sealants shall be thoroughly mixed in the ratio recommended by the manufacturer with power driven agitators or the static mixer process, respectively.

### **10-1.30 REINFORCEMENT**

Reinforcement shall conform to the provisions in Section 52, "Reinforcement," of the Standard Specifications.

The third paragraph of Section 52-1.04, "Inspection," of the Standard Specifications is amended to read:

- A Certificate of Compliance conforming to the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications shall also be furnished for each shipment of epoxy-coated bar reinforcement or wire reinforcement certifying that the coated reinforcement conforms to the requirements in ASTM Designation: A 775/A 775M or A 884/A 884M, respectively, and the provisions in Section 52-1.02B, "Epoxy-coated Bar Reinforcement," of the Standard Specifications. The Certificate of Compliance shall include all the certifications specified in ASTM Designation: A 775/A 775M or A 884/A 884M, respectively, and a statement that the coating material has been prequalified by acceptance testing performed by the Valley Forge Laboratories, Inc., Devon, Pennsylvania.

The length of any type of ultimate mechanical butt splice shall not exceed 10 times the bar diameter of the bar to be spliced.

### **ULTIMATE BUTT SPLICES**

Ultimate butt splices shall be either welded or mechanical splices, shall be used at the locations shown on the plans, and shall conform to the provisions in Section 52, "Reinforcement," of the Standard Specifications and these special provisions.

### **GENERAL REQUIREMENTS**

The Contractor shall designate in writing an ultimate butt splicing Quality Control Manager (QCM). The QCM shall be responsible directly to the Contractor for 1) the quality of all ultimate butt splicing including the inspection of materials and workmanship performed by the Contractor and all subcontractors; and 2) submitting, receiving, and approving all correspondence, required submittals, and reports regarding ultimate butt splicing to and from the Engineer.

The QCM shall not be employed or compensated by any subcontractor, or by other persons or entities hired by subcontractors, who will provide other services or materials for the project. The QCM may be an employee of the Contractor.

The length of any type of ultimate mechanical butt splice shall not exceed 10 times the bar diameter of the larger bar to be spliced.

All ultimate prejob, production, and job control sample splices shall be 1) a minimum length of 1.5 meters for reinforcing bars No. 25 or smaller and 2 meters for reinforcing bars No. 29 or larger, with the splice located at mid-point, and 2) suitably identified prior to shipment with weatherproof markings that do not interfere with the Engineer's tamper-proof markings or seals. Any splice that shows signs of tampering will be rejected.

A minimum of one control bar shall be removed from the same bar as, and adjacent to, all ultimate prejob, production, and job control sample splices. Control bars shall be 1) a minimum length of one meter for reinforcing bars No. 25 or smaller and 1.5 meters for reinforcing bars No. 29 or larger, and 2) suitably identified prior to shipment with weatherproof markings that do not interfere with the Engineer's tamper-proof markings or seals. The portion of adjacent bar remaining in the work shall also be identified with weatherproof markings that correspond to its adjacent control bar.

Shorter length sample splice and control bars may be furnished if approved in writing by the Engineer.

Each sample splice and its associated control bar shall be identified and marked as a set. Each set shall be identified as representing a prejob, production, or job control sample splice.

The portion of hoop reinforcing bar, removed to obtain a sample splice and control bar, shall be replaced using a prequalified ultimate mechanical butt splice, or the hoop shall be replaced in kind.

Reinforcing bars, other than hoops, from which sample splices are removed, shall be repaired using ultimate mechanical butt splices conforming to the provisions in "Prejob Test Requirements for Ultimate Butt Splices" specified herein, or the bars shall be replaced in kind. These bars shall be repaired or replaced such that no splices are located in the "No Splice Zone" shown on the plans.

Section 52-1.08E, "Job Control Tests," of the Standard Specifications shall not apply.

The provisions for total slip shall not apply to any ultimate splices that are welded or that are used on hoops.

The independent qualified testing laboratory used to perform the testing of all ultimate butt sample splices and control bars shall not be employed or compensated by any subcontractor, or by other persons or entities hired by subcontractors who will provide other services or materials for the project, and shall have the following:

- A. Proper facilities, including a tensile testing machine capable of breaking the largest size of reinforcing bar to be tested.
- B. A device for measuring the total slip of the reinforcing bars across the splice to the nearest 25  $\mu\text{m}$ , that, when placed parallel to the longitudinal axis of the bar is able to simultaneously measure movement across the splice, at 2 locations, 180 degrees apart.
- C. Operators who have received formal training for performing the testing requirements of ASTM Designation: A 370/A 370M and California Test 670.
- D. A record of annual calibration of testing equipment performed by an independent third party that has 1) standards that are traceable to the National Institute of Standards and Technology, and 2) a formal reporting procedure, including published test forms.

#### **ULTIMATE BUTT SPLICE TEST CRITERIA**

Ultimate prejob, production, and job control sample splices shall be tensile tested in conformance with the requirements described in ASTM Designation: A 370/A 370M and California Test 670.

Ultimate prejob and production sample splices shall rupture in the reinforcing bar either: 1) outside of the affected zone or 2) within the affected zone, provided that the sample has achieved at least 95 percent of the ultimate tensile strength of the control bar associated with the sample. In addition, necking of the bar shall be visibly evident at rupture regardless of whether the bar breaks inside or outside the affected zone.

The affected zone is the portion of the reinforcing bar where any properties of the bar, including the physical, metallurgical, or material characteristics, have been altered by fabrication or installation of the splice.

The ultimate tensile strength of each control bar shall be determined by tensile testing the bar to rupture and shall be determined for all control bars, regardless of where each sample splice ruptures. If 2 control bars are tested for one sample splice, the bar with the lower ultimate tensile strength shall be considered the control bar.

Testing to determine the minimum tensile strength, in conformance with the provisions in the ninth paragraph of Section 52-1.08, "Splicing," of the Standard Specifications, will not be required.

#### **PREJOB TEST REQUIREMENTS FOR ULTIMATE BUTT SPLICES**

Prior to use in the work, all ultimate butt splices shall conform to the following prejob test requirements:

- A. Eight prejob sample splices for each bar size of each splice type including ultimate mechanical butt splices, ultimate complete joint penetration butt welded splices, and ultimate resistance butt welded splices, that will be used in the work, shall be fabricated by the Contractor. For deformation-dependent types of couplers, 8 sample prejob splices shall also be fabricated for each reinforcing bar size and deformation pattern that will be used in the work.
- B. The sample splices shall be fabricated using the same splice materials, position, operators, location, and equipment, and following the same procedures as will be used to make the splices in the work.
- C. At the option of the Contractor, operator qualification tests may be performed simultaneously with the preparation of prejob sample splices.
- D. If different diameters of hoops are shown on the plans, prejob sample splices, as described above, will only be required for the smallest hoop diameter. In addition, these splices shall be fabricated using the same radius as shown on the plans for these hoops.
- E. Unless otherwise directed in writing by the Engineer, 4 prejob sample splices and control bar sets shall be shipped to the Transportation Laboratory and the remaining 4 sets shall be tested by the Contractor's independent qualified testing laboratory.
- F. Each group of 4 sets from a prejob test shall be securely bundled together and identified by location and contract number with weatherproof markings prior to shipment. Bundles containing fewer than 4 sets will not be tested by the Transportation Laboratory, nor shall they be tested by the independent laboratory.

- G. All 8 sample splices from each prejob test shall conform to the provisions in "Ultimate Butt Splice Test Criteria" specified herein.
- H. Prior to performing any tensile tests on prejob test sample splices, one of the 4 samples shall be tested for, and shall conform to, the provisions for total slip. Should this sample not meet these requirements, one retest, in which the 3 remaining samples are tested for total slip, will be allowed. All 3 of these remaining samples tested shall conform to the aforementioned slip requirements.
- I. For each bundle of 4 sets, a Prejob Test Report shall be prepared by the independent testing laboratory performing the testing. The report shall 1) be signed by an engineer who represents the laboratory and is registered as a Civil Engineer in the State of California; 2) include, as a minimum, the following information for each set: contract number, bridge number, bar size, type of splice, length of mechanical splice, physical condition of test sample splice and control bar, any notable defects, limits of affected zone, total measured slip, location of visible necking area, ultimate strength of each splice, ultimate strength and 95 percent of this ultimate strength for each control bar, and a comparison between 95 percent of the ultimate strength of each control bar and the ultimate strength of its associated splice; and 3) be submitted to the QCM for review and approval, and then to the Engineer.
- J. Test results for each bundle of 4 sets will be reported in writing to the Contractor within 10 working days after receipt of the bundle by the Transportation Laboratory. In the event that more than one bundle is received on the same day, 2 additional working days shall be allowed for providing test results for each additional bundle received. A test report will be made for each bundle received.
- K. Should the Engineer fail to provide the test results within this time allowance and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of the delay in providing the test results, the delay will be considered a right of way delay in conformance with the provisions in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

## **PRODUCTION TEST REQUIREMENTS FOR ULTIMATE BUTT SPLICES**

Production tests shall be performed for all ultimate butt splices used in the work. A production test shall consist of 4 sets of sample splices and control bars removed from each lot of completed splices, except when quality assurance tests are performed.

A lot of ultimate butt splices is defined as 1) 150, or fraction thereof, of the same type of ultimate mechanical butt splices used for each bar size and each bar deformation pattern that is used in the work or 2) 150, or fraction thereof, of ultimate complete joint penetration butt welded splices, or ultimate resistance butt welded splices for each bar size used in the work. If different diameters of hoop reinforcement are shown on the plans, separate lots shall be used for each different hoop diameter.

After all splices in a lot have been completed, the QCM shall notify the Engineer in writing that all couplers in this lot conform to the specifications and are ready for testing. The sample splices will either be selected by the Engineer at the job site or a fabrication facility, provided the facility is located within an 80-km radius of the jobsite.

At the option of the Contractor, sample splices for spiral reinforcement may be either 1) removed from the completed lot, or 2) prepared in the same manner as specified herein for ultimate prejob sample splices and control bars.

After notification has been received, the Engineer will randomly select the 4 sample splices to be removed from the lot and place tamper-proof markings or seals on them. The Contractor or QCM shall select the adjacent control bar for each sample splice bar, and the Engineer will place tamper-proof markings or seals on them. These ultimate production sample splices and control bars shall be removed by the Contractor, and tested by an independent qualified testing laboratory, in the presence of either the Engineer or the Engineer's authorized representative.

The Engineer or the Engineer's authorized representative will be at the independent qualified testing laboratory within a maximum of 5 working days after receiving written notification that the samples are at the laboratory and ready for testing. Should the Engineer or the Engineer's authorized representative fail to be at the laboratory within this time allowance, and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of this action, the delay will be considered a right of way delay in conformance with the provisions in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

A sample splice or control bar from any set will be rejected if any tamper-proof marking or seal is disturbed prior to testing.

The 4 sets from each production test shall be securely bundled together and identified with a completed sample identification card prior to shipment to the independent laboratory. The card will be furnished by the Engineer. Bundles of samples containing fewer than 4 sets of splices shall not be tested.

A Production Test Report for all testing performed on each lot shall be prepared by the independent testing laboratory performing the testing and submitted to the QCM for review and approval. The report shall be signed by an engineer who represents the laboratory and is registered as a Civil Engineer in the State of California. The report shall include, as a minimum, the following information for each set: contract number, bridge number, lot number and location, bar size, type of splice, length of mechanical splice, physical condition of test sample splice and control bar, any notable defects, limits of

affected zone, total measured slip, location of visible necking area, ultimate strength of each splice, ultimate strength and 95 percent of this ultimate strength for each control bar, and a comparison between 95 percent of the ultimate strength of each control bar and the ultimate strength of its associated splice.

The QCM must review, approve, and forward each Production Test Report to the Engineer for review before any splices represented by the report are encased in concrete. The Engineer shall have 3 working days to review each Production Test Report and respond in writing after a complete report has been received. Should the Contractor elect to encase any splices prior to receiving notification from the Engineer, it is expressly understood that the Contractor will not be relieved of the Contractor's responsibility for incorporating material in the work that conforms to the requirements of the plans and specifications. Any material not conforming to these requirements will be subject to rejection. Should the Contractor elect to wait to encase any splices pending notification by the Engineer, and should the Engineer fail to complete the review and provide notification within this time allowance, and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of the delay in notification, the delay will be considered a right of way delay in conformance with the provisions in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

Prior to performing any tensile tests on production test sample splices, one of the 4 samples shall be tested for, and shall conform to, the provisions for total slip. Should this sample not meet these requirements, one retest, in which the 3 remaining samples are tested for total slip, will be allowed. Should any of the 3 remaining samples not conform to these requirements, all splices in the lot represented by this production test will be rejected.

If 3 or more sample splices from any production test conform to the provisions in "Ultimate Butt Splice Test Criteria" specified herein, all splices in the lot represented by this production test will be considered acceptable.

Should only 2 sample splices from any production test conform to the provisions in "Ultimate Butt Splice Test Criteria" specified herein, one additional production test shall be performed on the same lot of splices. Should any of the 4 sample splices from this additional test do not conform to these provisions, all splices in the lot represented by these production tests will be rejected.

If only one sample splice from any production test conforms to the provisions in "Ultimate Butt Splice Test Criteria" specified herein, all splices in the lot represented by this production test will be rejected.

If a production test for any lot fails, the Contractor will be required to repair or replace all reinforcing bars from which sample splices were removed, complete in place, before the Engineer selects any additional splices from this lot for further testing.

Whenever any lot of ultimate butt splices is rejected, additional ultimate butt splices shall not be used in the work until 1) the QCM performs a complete review of the Contractor's quality control process for these splices, 2) a written report is submitted to the Engineer describing the cause of failure for the splices in this lot and provisions for correcting these failures in future lots, and 3) the Engineer has provided the Contractor with written notification that the report is acceptable. The Engineer shall have 3 working days after receipt of the report to provide notification to the Contractor. Should the Engineer not provide notification within this time allowance, and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of this action, the delay will be considered a right of way delay in conformance with the provisions in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

Production tests will not be required on any repaired splice from a lot, regardless of the type of prequalified ultimate mechanical butt splice used to make the repair.

Should an additional production test be required, the Engineer may select any repaired splice for use in the additional production test.

### **QUALITY ASSURANCE TEST REQUIREMENTS FOR ULTIMATE BUTT SPLICES**

For the first production test performed, and for at least one, randomly selected by the Engineer, of every 5 additional production tests, or portion thereof, performed thereafter, the Contractor shall concurrently prepare 4 additional ultimate job control sample splices along with associated control bars. These ultimate job control samples shall be prepared in the same manner as specified herein for ultimate prejob sample splices and control bars.

Each time 4 additional ultimate job control sample splices are prepared, 2 of these job control sample splice and associated control bar sets and 2 of the production sample splice and associated control bar sets, together, shall conform to the requirements for ultimate production sample splices in "Production Test Requirements for Ultimate Butt Splices" specified herein.

The 2 remaining job control sample splice and associated control bar sets, along with the 2 remaining production sample splice and associated control bar sets shall be shipped, unless otherwise directed in writing by the Engineer, to the Transportation Laboratory for quality assurance testing. The 4 sets shall be securely bundled together and identified by location and contract number with weatherproof markings prior to shipment. Bundles containing fewer than 4 sets will not be tested.

Quality assurance testing will be performed in conformance with the requirements for ultimate production sample splices in "Production Test Requirements for Ultimate Butt Splices" specified herein.

Test results for each bundle of 4 sets will be reported in writing to the Contractor within 3 working days after receipt of the bundle by Transportation Laboratory. In the event that more than one bundle is received on the same day, 2 additional working days shall be allowed for providing test results for each additional bundle received. A test report will be made for each bundle received. Should the Contractor elect to encase any splices prior to receiving notification from the Engineer, it is expressly understood that the Contractor will not be relieved of the Contractor's responsibility for incorporating material in the work that conforms to the requirements of the plans and specifications. Any material not conforming to these requirements will be subject to rejection. Should the Contractor elect to wait to encase any splices pending notification by the Engineer, and should the Engineer fail to complete the review and provide notification within this time allowance, and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of the delay in notification, the delay will be considered a right of way delay in conformance with the provisions in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

## **MEASUREMENT AND PAYMENT**

Measurement and payment for reinforcement in structures shall conform to the provisions in Section 52-1.10, "Measurement," and Section 52-1.11, "Payment," of the Standard Specifications and these special provisions.

Full compensation for conforming to the provisions of "Ultimate Butt Splices," of these special provisions shall be considered as included in the contract prices paid for the various contract items of work involved and no additional compensation will be allowed therefor.

### **10-1.31 WELDED STEEL PIPE CASING (BRIDGE)**

Welded steel pipe casings through bridges and under approach slabs shall be of the size shown and shall conform to the provisions in Section 70, "Miscellaneous Facilities," of the Standard Specifications and these special provisions.

Unless otherwise shown on the project plans, casings shall be installed at each abutment, and casings shall be extended to the greater of: (1) 1.5 m beyond the approach slab, (2) 1.5 m beyond the end of the adjacent wingwall or (3) 6 m beyond the abutment.

#### **Working drawings**

Working drawings for temporary support of casing pipe at the abutments shall be submitted for approval in conformance with the provisions in Section 5-1.02, "Plans and Working Drawings" of the Standard Specifications.

#### **Casing pipe**

Casing pipe shall be welded steel pipe conforming to the provisions in Section 70-1.02B, "Welded Steel Pipe," of the Standard Specifications, except that the pipe shall be treated in accordance with the following requirements, prior to shipping. Exterior surfaces of welded steel pipe shall be cleaned and coated in conformance with the requirements in ANSI/AWWA C213 or at the option of the Contractor, cleaned, primed, and coated in accordance with specifications of ANSI/AWWA C214.

#### **Pipe wrapping tape**

Wrapping tapes for pipe in contact with the ground shall be a pressure sensitive polyvinyl chloride or polyethylene tape having thickness of 1.27 mm, minimum.

If a blockout is provided in the bridge abutment wall for casing pipe, the space between the casing pipe and bridge abutment wall shall be filled with portland cement mortar conforming to the provisions in Section 51-1.135, "Mortar," of the Standard Specifications.

Openings for utilities through bridge superstructure concrete shall either be formed or shall consist of pipe sleeves.

#### **Wrapping and coating pipe**

Damaged coating on steel pipe casing in contact with earth shall be wrapped as follows:

- A. Pipe to be wrapped shall be thoroughly cleaned and primed as recommended by the tape manufacturer.
- B. Tapes shall be tightly applied with 1/2 uniform lap, free from wrinkles and voids to provide not less than 2.5 mm thickness.
- C. Field joints and fittings for wrapped pipe shall be covered by double wrapping 1.27 mm thick tape. Wrapping at joints shall extend a minimum of 150 mm over adjacent pipe coverings. Width of tape for wrapping fittings shall not exceed 50 mm. Adequate tension shall be applied so tape will conform closely to contours of joint.



Where a welded steel pipe casing passes through the abutment wall, the welded steel pipe casing shall be additionally wrapped with 2 layers of No. 15 asphalt-felt building paper, securely taped or wired in place.

Welded steel pipe casing (bridge) will be measured and paid for as miscellaneous metal (bridge).

Full compensation for furnishing and installing steel cover plates, mortar and building paper, and other fittings, casing, concrete supports, shall be considered as included in the contract price paid for the welded steel pipe casing involved-and no additional compensation will be allowed therefor.

#### **10-1.32 CORRUGATED METAL PIPE**

Corrugated steel pipe culverts shall conform to the provisions in Section 66, "Corrugated Metal Pipe," of the Standard Specifications and these special provisions.

Corrugated steel pipe shall be fabricated from zinc-coated steel sheet.

#### **10-1.33 MISCELLANEOUS FACILITIES**

Steel flared end sections shall conform to the provisions in Section 70, "Miscellaneous Facilities," of the Standard Specifications.

#### **10-1.34 SLOPE PROTECTION**

Slope protection shall be placed or constructed in conformance with the provisions in Section 72, "Slope Protection," of the Standard Specifications and these specifications.

Rock slope protection fabric shall be woven or nonwoven type fabric, Type A or Type B, at the option of the Contractor.

#### **10-1.35 MISCELLANEOUS METAL (BRIDGE)**

Miscellaneous metal (bridge) shall conform to the provisions for miscellaneous bridge metal in Section 75, "Miscellaneous Metal," of the Standard Specifications and these special provisions.

Miscellaneous metal (bridge) shall consist of the miscellaneous bridge metal items listed in Section 75-1.03, "Miscellaneous Bridge Metal," of the Standard Specifications, and the following:

A. Isolation casing for load test pile

Cast-in-place inserts shall be the ferrule loop type.

All metal parts of anchorage devices shall be fabricated from stainless steel conforming to the requirements of ASTM Designation: A 276, Type 304 or 316.

#### **10-1.36 TYPE WM FENCE**

Type WM fence shall conform to the provisions in Section 80, "Fences," of the Standard Specifications and these special provisions.

The fence material shall be fastened to wood posts.

#### **10-1.37 MARKERS AND DELINEATORS**

Markers and delineators shall conform to the provisions in Section 82, "Markers and Delineators," of the Standard Specifications and these special provisions.

Markers and delineators on flexible posts shall conform to the provisions in "Approved Traffic Products" of these special provisions. Flexible posts shall be made from a flexible white plastic which shall be resistant to impact, ultraviolet light, ozone, and hydrocarbons. Flexible posts shall resist stiffening with age and shall be free of burns, discoloration, contamination, and other objectionable marks or defects which affect appearance or serviceability.

Retroreflective sheeting for metal and flexible target plates shall be the retroreflective sheeting designated for channelizers, markers, and delineators conforming to the requirements in ASTM Designation: D 4956-95 and in conformance with the provisions in "Approved Traffic Products" of these special provisions.

#### **10-1.38 METAL BEAM GUARD RAILING**

Metal beam guard railing shall be constructed in conformance with the provisions in Section 83-1, "Railings," of the Standard Specifications and these special provisions.

Attention is directed to "Order of Work" of these special provisions.

Line posts and blocks shall be wood.

Delete the ninth and eleventh paragraphs in Section 83-1.02B, "Metal Beam Guard Railing," of the Standard Specifications.

The grades and species of wood posts and blocks shall be No. 1 timbers (also known as No. 1 structural) Douglas fir or No. 1 timbers Southern yellow pine. Wood posts and blocks shall be graded in conformance with the provisions in Section 57-2, "Structural Timber," of the Standard Specifications, except allowances for shrinkage after mill cutting shall in no case exceed 5 percent of the American Lumber Standards minimum sizes, at the time of installation.

Wood posts and blocks shall be pressure treated after fabrication in conformance with the provisions in Section 58, "Preservative Treatment of Lumber, Timber and Piling," of the Standard Specifications with creosote, creosote coal tar solution, creosote petroleum solution (50-50), pentachlorophenol in hydrocarbon solvent, copper naphthenate, ammoniacal copper arsenate, or ammoniacal copper zinc arsenate. In addition to the preservatives listed above, Southern yellow pine may also be pressure treated with chromated copper arsenate. When other than one of the creosote processes is used, blocks shall have a minimum retention of 6.4 Kg/m<sup>3</sup>, and need not be incised.

#### **TERMINAL SYSTEM (TYPE SRT)**

Terminal system (Type SRT) shall be furnished and installed as shown on the plans and in conformance with these special provisions.

Terminal system (Type SRT) shall be a SRT-350 Slotted Rail Terminal as manufactured by Syro, Inc., a Trinity Industries Company, and shall include all the items detailed for terminal system (Type SRT) shown on the plans.

Arrangements have been made to insure that any successful bidder can obtain the SRT-350 Slotted Rail Terminal from the manufacturer, Syro, Inc., a Trinity Industries Company, P.O. Box 99, 950 West 400S, Centerville, UT 84014, Telephone 1-800-772-7976. The price quoted by the manufacturer for the SRT-350 Slotted Rail Terminal, FOB Centerville, Utah is \$865.00, not including sales tax.

The above price will be firm for orders placed on or before December 31, 2000, provided delivery is accepted within 90 days after the order is placed.

The Contractor shall provide the Engineer with a Certificate of Compliance from the manufacturer in conformance with the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications. The Certificate of Compliance shall certify that terminal systems (Type SRT) conform to the contract plans and specifications, conform to the prequalified design and material requirements and were manufactured in conformance with the approved quality control program.

The terminal system (Type SRT) shall be installed in conformance with the manufacturer's installation instructions and these requirements. At the Contractor's option, steel foundation tubes with soil plates attached, shall be either driven, with or without pilot holes, or placed in drilled holes. Space around the steel foundation tubes shall be backfilled with selected earth, free of rock, placed in layers approximately 100 mm thick and each layer shall be moistened and thoroughly compacted. Wood terminal posts shall be inserted into the steel foundation tubes by hand. Before the wood terminal posts are inserted, the inside surfaces of the steel foundation tubes to receive the wood posts shall be coated with a grease which will not melt or run at a temperature of 65°C or less. The edges of the wood terminal posts may be slightly rounded to facilitate insertion of the post into the steel foundation tubes.

Surplus excavated material remaining after the terminal system (Type SRT) has been constructed shall be disposed of in a uniform manner along the adjacent roadway where designated by the Engineer.

#### **10-1.39 CONCRETE BARRIER**

Concrete barriers shall conform to the provisions in Section 83-2, "Barriers," of the Standard Specifications.

#### **10-1.40 THERMOPLASTIC TRAFFIC STRIPE AND PAVEMENT MARKING**

Thermoplastic traffic stripes (traffic lines) and pavement markings shall be applied in conformance with the provisions in Section 84, "Traffic Stripes and Pavement Markings," of the Standard Specifications and these special provisions.

Where striping joins existing striping, as shown on the plans, the Contractor shall begin and end the transition from the existing striping pattern into or from the new striping pattern a sufficient distance to ensure continuity of the striping pattern.

Thermoplastic material for traffic stripes shall be applied at a minimum thickness of 2.03 mm.

At the option of the Contractor, permanent striping tape as specified in "Approved Traffic Products" of these special provisions, may be placed instead of the thermoplastic traffic stripes and pavement markings specified herein, except that 3M, "Stamark" Series A320 Bisymmetric Grade, manufactured by the 3M Company, shall not be used. Pavement tape, if used, shall be installed in conformance with the manufacturer's specifications. If pavement tape is placed instead of thermoplastic traffic stripes and pavement markings, the pavement tape will be measured and paid for by the meter as thermoplastic traffic stripe and by the square meter as thermoplastic pavement marking.

#### **10-1.41 PAVEMENT MARKERS**

Pavement markers shall be placed in conformance with the provisions in Section 85, "Pavement Markers," of Standard Specifications and these special provisions.

Retroreflective pavement markers shall comply with the specific intensity provisions for reflectance after abrading the lens surface in conformance with the "Steel Wool Abrasion Procedure" specified for pavement markers placed in pavement recesses in Section 85-1.05, "Retroreflective Pavement Markers," of the Standard Specifications.

Retroreflective pavement markers placed in pavement recesses will be measured and paid for as pavement marker (retroreflective-recessed).

**SECTION 11-. (BLANK)**

**SECTION 12. (BLANK)**

**SECTION 13. (BLANK)**

## SECTION 14 FEDERAL REQUIREMENTS FOR FEDERAL-AID CONSTRUCTION PROJECTS

**GENERAL.**—The work herein proposed will be financed in whole or in part with Federal funds, and therefore all of the statutes, rules and regulations promulgated by the Federal Government and applicable to work financed in whole or in part with Federal funds will apply to such work. The "Required Contract Provisions, Federal-Aid Construction Contracts, "Form FHWA 1273, are included in this Section 14. Whenever in said required contract provisions references are made to "SHA contracting officer", "SHA resident engineer", or "authorized representative of the SHA", such references shall be construed to mean "Engineer" as defined in Section 1-1.18 of the Standard Specifications.

**PERFORMANCE OF PREVIOUS CONTRACT.**—In addition to the provisions in Section II, "Nondiscrimination," and Section VII, "Subletting or Assigning the Contract," of the required contract provisions, the Contractor shall comply with the following:

The bidder shall execute the CERTIFICATION WITH REGARD TO THE PERFORMANCE OF PREVIOUS CONTRACTS OR SUBCONTRACTS SUBJECT TO THE EQUAL OPPORTUNITY CLAUSE AND THE FILING OF REQUIRED REPORTS located in the proposal. No request for subletting or assigning any portion of the contract in excess of \$10,000 will be considered under the provisions of Section VII of the required contract provisions unless such request is accompanied by the CERTIFICATION referred to above, executed by the proposed subcontractor.

**NON-COLLUSION PROVISION.**—The provisions in this section are applicable to all contracts except contracts for Federal Aid Secondary projects.

Title 23, United States Code, Section 112, requires as a condition precedent to approval by the Federal Highway Administrator of the contract for this work that each bidder file a sworn statement executed by, or on behalf of, the person, firm, association, or corporation to whom such contract is to be awarded, certifying that such person, firm, association, or corporation has not, either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of free competitive bidding in connection with the submitted bid. A form to make the non-collusion affidavit statement required by Section 112 as a certification under penalty of perjury rather than as a sworn statement as permitted by 28, USC, Sec. 1746, is included in the proposal.

**PARTICIPATION BY MINORITY BUSINESS ENTERPRISES IN SUBCONTRACTING.**—Part 23, Title 49, Code of Federal Regulations applies to this Federal-aid project. Pertinent sections of said Code are incorporated in part or in its entirety within other sections of these special provisions.

### Schedule B—Information for Determining Joint Venture Eligibility

(This form need not be filled in if all joint venture firms are minority owned.)

1. Name of joint venture \_\_\_\_\_
2. Address of joint venture \_\_\_\_\_
3. Phone number of joint venture \_\_\_\_\_
4. Identify the firms which comprise the joint venture. (The MBE partner must complete Schedule A.) \_\_\_\_\_  
\_\_\_\_\_  
  - a. Describe the role of the MBE firm in the joint venture. \_\_\_\_\_
  - b. Describe very briefly the experience and business qualifications of each non-MBE joint venturer: \_\_\_\_\_  
\_\_\_\_\_
5. Nature of the joint venture's business \_\_\_\_\_
6. Provide a copy of the joint venture agreement.
7. What is the claimed percentage of MBE ownership? \_\_\_\_\_
8. Ownership of joint venture: (This need not be filled in if described in the joint venture agreement, provided by question 6.).
  - a. Profit and loss sharing.
  - b. Capital contributions, including equipment.
  - c. Other applicable ownership interests.

9. Control of and participation in this contract. Identify by name, race, sex, and "firm" those individuals (and their titles) who are responsible for day-to-day management and policy decision making, including, but not limited to, those with prime responsibility for:

a. Financial decisions \_\_\_\_\_

b. Management decisions, such as:

(1) Estimating \_\_\_\_\_

(2). Marketing and sales \_\_\_\_\_

(3). Hiring and firing of management personnel \_\_\_\_\_

(4) Purchasing of major items or supplies \_\_\_\_\_

c. Supervision of field operations \_\_\_\_\_

Note.—If, after filing this Schedule B and before the completion of the joint venture's work on the contract covered by this regulation, there is any significant change in the information submitted, the joint venture must inform the grantee, either directly or through the prime contractor if the joint venture is a subcontractor.

#### Affidavit

"The undersigned swear that the foregoing statements are correct and include all material information necessary to identify and explain the terms and operation of our joint venture and the intended participation by each joint venturer in the undertaking. Further, the undersigned covenant and agree to provide to grantee current, complete and accurate information regarding actual joint venture work and the payment therefor and any proposed changes in any of the joint venture arrangements and to permit the audit and examination of the books, records and files of the joint venture, or those of each joint venturer relevant to the joint venture, by authorized representatives of the grantee or the Federal funding agency. Any material misrepresentation will be grounds for terminating any contract which may be awarded and for initiating action under Federal or State laws concerning false statements."

|                       |                       |
|-----------------------|-----------------------|
| _____<br>Name of Firm | _____<br>Name of Firm |
| _____<br>Signature    | _____<br>Signature    |
| _____<br>Name         | _____<br>Name         |
| _____<br>Title        | _____<br>Title        |
| _____<br>Date         | _____<br>Date         |

Date \_\_\_\_\_

State of \_\_\_\_\_

County of \_\_\_\_\_

On this \_\_\_\_ day of \_\_\_\_\_, 19 \_\_, before me appeared (Name) \_\_\_\_\_, to me personally known, who, being duly sworn, did execute the foregoing affidavit, and did state that he or she was properly authorized by (Name of firm) \_\_\_\_\_ to execute the affidavit and did so as his or her free act and deed.

Notary Public \_\_\_\_\_

Commission expires \_\_\_\_\_

[Seal]

Date \_\_\_\_\_

State of \_\_\_\_\_

County of \_\_\_\_\_

On this \_\_\_\_ day of \_\_\_\_\_, 19 \_\_, before me appeared (Name) \_\_\_\_\_ to me personally known, who, being duly sworn, did execute the foregoing affidavit, and did state that he or she was properly authorized by (Name of firm) \_\_\_\_\_ to execute the affidavit and did so as his or her free act and deed.

Notary Public \_\_\_\_\_

Commission expires \_\_\_\_\_

[Seal]

**REQUIRED CONTRACT PROVISIONS  
FEDERAL-AID CONSTRUCTION CONTRACTS**

**I. GENERAL**

1. These contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract.
2. Except as otherwise provided for in each section, the contractor shall insert in each subcontract all of the stipulations contained in these Required Contract Provisions, and further require their inclusion in any lower tier subcontract or purchase order that may in turn be made. The Required Contract Provisions shall not be incorporated by reference in any case. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with these Required Contract Provisions.
3. A breach of any of the stipulations contained in these Required Contract Provisions shall be sufficient grounds for termination of the contract.
4. A breach of the following clauses of the Required Contract Provisions may also be grounds for debarment as provided in 29 CFR 5.12:

Section I, paragraph 2;  
Section IV, paragraphs 1, 2, 3, 4, and 7;  
Section V, paragraphs 1 and 2a through 2g.

5. Disputes arising out of the labor standards provisions of Section IV (except paragraph 5) and Section V of these Required Contract Provisions shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the U.S. Department of Labor (DOL) as set forth in 29 CFR 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the DOL, or the contractor's employees or their representatives.
6. **Selection of Labor:** During the performance of this contract, the contractor shall not:
  - a. discriminate against labor from any other State, possession, or territory of the United States (except for employment preference for Appalachian contracts, when applicable, as specified in Attachment A), or
  - b. employ convict labor for any purpose within the limits of the project unless it is labor performed by convicts who are on parole, supervised release, or probation.

**II. NONDISCRIMINATION**

(Applicable to all Federal-aid construction contracts and to all related subcontracts of \$10,000 or more.)

1. **Equal Employment Opportunity:** Equal employment opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (28 CFR 35, 29 CFR 1630, and 41 CFR 60) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140 shall constitute the EEO and specific affirmative action standards for the contractor's project activities under this contract. The Equal Opportunity Construction Contract Specifications set forth under 41 CFR 60-4.3 and the provisions of the American Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR 35 and 29 CFR 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:
  - a. The contractor will work with the State highway agency (SHA) and the Federal Government in carrying out EEO obligations and in their review of his/her activities under the contract.
  - b. The contractor will accept as his operating policy the following statement:

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color, national origin, age or disability. Such action shall

include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, preapprenticeship, and/or on-the-job training."

2. **EEO Officer:** The contractor will designate and make known to the SHA contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active contractor program of EEO and who must be assigned adequate authority and responsibility to do so.
3. **Dissemination of Policy:** All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:
  - a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer.
  - b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.
  - c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minority group employees.
  - d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.
  - e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.
4. **Recruitment:** When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minority groups in the area from which the project work force would normally be derived.
  - a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minority group applicants. To meet this requirement, the contractor will identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority group applicants may be referred to the contractor for employment consideration.
  - b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, he is expected to observe the provisions of that agreement to the extent that the system permits the contractor's compliance with EEO contract provisions. (The DOL has held that where implementation of such agreements have the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Executive Order 11246, as amended.)
  - c. The contractor will encourage his present employees to refer minority group applicants for employment. Information and procedures with regard to referring minority group applicants will be discussed with employees.
5. **Personnel Actions:** Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, national origin, age or disability. The following procedures shall be followed:
  - a. The contractor will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.



- b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.
  - c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.
  - d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with his obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of his avenues of appeal.
6. Training and Promotion:
- a. The contractor will assist in locating, qualifying, and increasing the skills of minority group and women employees, and applicants for employment.
  - b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision.
  - c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.
  - d. The contractor will periodically review the training and promotion potential of minority group and women employees and will encourage eligible employees to apply for such training and promotion.
7. **Unions:** If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use his/her best efforts to obtain the cooperation of such unions to increase opportunities for minority groups and women within the unions, and to effect referrals by such unions of minority and female employees. Actions by the contractor either directly or through a contractor's association acting as agent will include the procedures set forth below:
- a. The contractor will use best efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minority group members and women for membership in the unions and increasing the skills of minority group employees and women so that they may qualify for higher paying employment.
  - b. The contractor will use best efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, national origin, age or disability.
  - c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the SHA and shall set forth what efforts have been made to obtain such information.
  - d. In the event the union is unable to provide the contractor with a reasonable flow of minority and women referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, national origin, age or disability; making full efforts to obtain qualified and/or qualifiable minority group persons and women. (The DOL has held that it shall be no excuse that the union with which the contractor has a collective bargaining agreement providing for exclusive referral failed to refer minority employees.) In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the SHA.

8. **Selection of Subcontractors, Procurement of Materials and Leasing of Equipment:** The contractor shall not discriminate on the grounds of race, color, religion, sex, national origin, age or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment.
- a. The contractor shall notify all potential subcontractors and suppliers of his/her EEO obligations under this contract.
  - b. Disadvantaged business enterprises (DBE), as defined in 49 CFR 23, shall have equal opportunity to compete for and perform subcontracts which the contractor enters into pursuant to this contract. The contractor will use his best efforts to solicit bids from and to utilize DBE subcontractors or subcontractors with meaningful minority group and female representation among their employees. Contractors shall obtain lists of DBE construction firms from SHA personnel.
  - c. The contractor will use his best efforts to ensure subcontractor compliance with their EEO obligations.
9. **Records and Reports:** The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following completion of the contract work and shall be available at reasonable times and places for inspection by authorized representatives of the SHA and the FHWA.
- a. The records kept by the contractor shall document the following:
    - (1) The number of minority and non-minority group members and women employed in each work classification on the project;
    - (2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women;
    - (3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minority and female employees; and
    - (4) The progress and efforts being made in securing the services of DBE subcontractors or subcontractors with meaningful minority and female representation among their employees.
  - b. The contractors will submit an annual report to the SHA each July for the duration of the project, indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on Form FHWA-1391. If on-the-job training is being required by special provision, the contractor will be required to collect and report training data.

### III. NONSEGREGATED FACILITIES

(Applicable to all Federal-aid construction contracts and to all related subcontracts of \$10,000 or more.)

- a. By submission of this bid, the execution of this contract or subcontract, or the consummation of this material supply agreement or purchase order, as appropriate, the bidder, Federal-aid construction contractor, subcontractor, material supplier, or vendor, as appropriate, certifies that the firm does not maintain or provide for its employees any segregated facilities at any of its establishments, and that the firm does not permit its employees to perform their services at any location, under its control, where segregated facilities are maintained. The firm agrees that a breach of this certification is a violation of the EEO provisions of this contract. The firm further certifies that no employee will be denied access to adequate facilities on the basis of sex or disability.
- b. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, restrooms and washrooms, restaurants and other eating areas, time clocks, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive, or are, in fact, segregated on the basis of race, color, religion, national origin, age or disability, because of habit, local custom, or otherwise. The only exception will be for the disabled when the demands for accessibility override (e.g. disabled parking).

- c. The contractor agrees that it has obtained or will obtain identical certification from proposed subcontractors or material suppliers prior to award of subcontracts or consummation of material supply agreements of \$10,000 or more and that it will retain such certifications in its files.

#### **IV. PAYMENT OF PREDETERMINED MINIMUM WAGE**

(Applicable to all Federal-aid construction contracts exceeding \$2,000 and to all related subcontracts, except for projects located on roadways classified as local roads or rural minor collectors, which are exempt.)

##### **1. General:**

- a. All mechanics and laborers employed or working upon the site of the work will be paid unconditionally and not less often than once a week and without subsequent deduction or rebate on any account [except such payroll deductions as are permitted by regulations (29 CFR 3)] issued by the Secretary of Labor under the Copeland Act (40 U.S.C. 276c) the full amounts of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment. The payment shall be computed at wage rates not less than those contained in the wage determination of the Secretary of Labor (hereinafter "the wage determination") which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor or its subcontractors and such laborers and mechanics. The wage determination (including any additional classifications and wage rates conformed under paragraph 2 of this Section IV and the DOL poster (WH-1321) or Form FHWA-1495) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers. For the purpose of this Section, contributions made or costs reasonably anticipated for bona fide fringe benefits under Section 1(b)(2) of the Davis-Bacon Act (40 U.S.C. 276a) on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of Section IV, paragraph 3b, hereof. Also, for the purpose of this Section, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs, which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in paragraphs 4 and 5 of this Section IV.
- b. Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein, provided, that the employer's payroll records accurately set forth the time spent in each classification in which work is performed.
- c. All rulings and interpretations of the Davis-Bacon Act and related acts contained in 29 CFR 1, 3, and 5 are herein incorporated by reference in this contract.

##### **2. Classification:**

- a. The SHA contracting officer shall require that any class of laborers or mechanics employed under the contract, which is not listed in the wage determination, shall be classified in conformance with the wage determination.
- b. The contracting officer shall approve an additional classification, wage rate and fringe benefits only when the following criteria have been met:
  - (1) the work to be performed by the additional classification requested is not performed by a classification in the wage determination;
  - (2) the additional classification is utilized in the area by the construction industry;
  - (3) the proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination; and
  - (4) with respect to helpers, when such a classification prevails in the area in which the work is performed.
- c. If the contractor or subcontractors, as appropriate, the laborers and mechanics (if known) to be employed in the additional classification or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the DOL, Administrator of the Wage and Hour Division, Employment Standards Administration, Washington, D.C. 20210. The Wage and Hour Administrator, or an authorized

representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

- d. In the event the contractor or subcontractors, as appropriate, the laborers or mechanics to be employed in the additional classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Wage and Hour Administrator for determination. Said Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary
- e. The wage rate (including fringe benefits where appropriate) determined pursuant to paragraph 2c or 2d of this Section IV shall be paid to all workers performing work in the additional classification from the first day on which work is performed in the classification.

### **3. Payment of Fringe Benefits:**

- a. Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor or subcontractors, as appropriate, shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly case equivalent thereof.
- b. If the contractor or subcontractor, as appropriate, does not make payments to a trustee or other third person, he/she may consider as a part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, provided, that the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

### **4. Apprentices and Trainees (Programs of the U.S. DOL) and Helpers:**

- a. Apprentices:
  - (1) Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the DOL, Employment and Training Administration, Bureau of Apprenticeship and Training, or with a State apprenticeship agency recognized by the Bureau, or if a person is employed in his/her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Bureau of Apprenticeship and Training or a State apprenticeship agency (where appropriate) to be eligible for probationary employment as an apprentice.
  - (2) The allowable ratio of apprentices to journeyman-level employees on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any employee listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate listed in the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor or subcontractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman-level hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.
  - (3) Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeyman-level hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator for the Wage and Hour Division determines that a different

practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.

- (4) In the event the Bureau of Apprenticeship and Training, or a State apprenticeship agency recognized by the Bureau, withdraws approval of an apprenticeship program, the contractor or subcontractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the comparable work performed by regular employees until an acceptable program is approved.

b. Trainees:

- (1) Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the DOL, Employment and Training Administration.
- (2) The ratio of trainees to journeyman-level employees on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.
- (3) Every trainee must be paid at not less than the rate specified in the approved program for his/her level of progress, expressed as a percentage of the journeyman-level hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman-level wage rate on the wage determination which provides for less than full fringe benefits for apprentices, in which case such trainees shall receive the same fringe benefits as apprentices.
- (4) In the event the Employment and Training Administration withdraws approval of a training program, the contractor or subcontractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

c. Helpers:

Helpers will be permitted to work on a project if the helper classification is specified and defined on the applicable wage determination or is approved pursuant to the conformance procedure set forth in Section IV.2. Any worker listed on a payroll at a helper wage rate, who is not a helper under an approved definition, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed.

**5. Apprentices and Trainees (Programs of the U.S. DOT):**

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeymen shall not be greater than permitted by the terms of the particular program.

**6. Withholding:**

The SHA shall upon its own action or upon written request of an authorized representative of the DOL withhold, or cause to be withheld, from the contractor or subcontractor under this contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to Davis-Bacon prevailing wage requirements which is held by the same prime contractor, as much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or

part of the wages required by the contract, the SHA contracting officer may, after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

**7. Overtime Requirements:**

No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers, mechanics, watchmen, or guards (including apprentices, trainees, and helpers described in paragraphs 4 and 5 above) shall require or permit any laborer, mechanic, watchman, or guard in any workweek in which he/she is employed on such work, to work in excess of 40 hours in such workweek unless such laborer, mechanic, watchman, or guard receives compensation at a rate not less than one-and-one-half times his/her basic rate of pay for all hours worked in excess of 40 hours in such workweek.

**8. Violation:**

**Liability for Unpaid Wages; Liquidated Damages:** In the event of any violation of the clause set forth in paragraph 7 above, the contractor and any subcontractor responsible thereof shall be liable to the affected employee for his/her unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory) for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer, mechanic, watchman, or guard employed in violation of the clause set forth in paragraph 7, in the sum of \$10 for each calendar day on which such employee was required or permitted to work in excess of the standard work week of 40 hours without payment of the overtime wages required by the clause set forth in paragraph 7.

**9. Withholding for Unpaid Wages and Liquidated Damages:**

The SHA shall upon its own action or upon written request of any authorized representative of the DOL withhold, or cause to be withheld, from any monies payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph 8 above.

## **V. STATEMENTS AND PAYROLLS**

(Applicable to all Federal-aid construction contracts exceeding \$2,000 and to all related subcontracts, except for projects located on roadways classified as local roads or rural collectors, which are exempt.)

**1. Compliance with Copeland Regulations (29 CFR 3):**

The contractor shall comply with the Copeland Regulations of the Secretary of Labor which are herein incorporated by reference.

**2. Payrolls and Payroll Records:**

- a. Payrolls and basic records relating thereto shall be maintained by the contractor and each subcontractor during the course of the work and preserved for a period of 3 years from the date of completion of the contract for all laborers, mechanics, apprentices, trainees, watchmen, helpers, and guards working at the site of the work.
- b. The payroll records shall contain the name, social security number, and address of each such employee; his or her correct classification; hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalent thereof of the types described in Section 1(b)(2)(B) of the Davis Bacon Act); daily and weekly number of hours worked; deductions made; and actual wages paid. In addition, for Appalachian contracts, the payroll records shall contain a notation indicating whether the employee does, or does not, normally reside in the labor area as defined in Attachment A, paragraph 1. Whenever the Secretary of Labor, pursuant to Section IV, paragraph 3b, has found that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in Section 1(b)(2)(B) of the Davis Bacon Act, the contractor and each subcontractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, that the plan or program has been communicated in writing to the laborers or mechanics affected, and show the cost anticipated or the actual cost incurred in providing benefits. Contractors or subcontractors employing

apprentices or trainees under approved programs shall maintain written evidence of the registration of apprentices and trainees, and ratios and wage rates prescribed in the applicable programs.

- c. Each contractor and subcontractor shall furnish, each week in which any contract work is performed, to the SHA resident engineer a payroll of wages paid each of its employees (including apprentices, trainees, and helpers, described in Section IV, paragraphs 4 and 5, and watchmen and guards engaged on work during the preceding weekly payroll period). The payroll submitted shall set out accurately and completely all of the information required to be maintained under paragraph 2b of this Section V. This information may be submitted in any form desired. Optional Form WH-347 is available for this purpose and may be purchased from the Superintendent of Documents (Federal stock number 029-005-0014-1), U.S. Government Printing Office, Washington, D.C. 20402. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors.
- d. Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his/her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:
  - (1) that the payroll for the payroll period contains the information required to be maintained under paragraph 2b of this Section V and that such information is correct and complete;
  - (2) that such laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in the Regulations, 29 CFR 3;
  - (3) that each laborer or mechanic has been paid not less than the applicable wage rate and fringe benefits or cash equivalent for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.
- e. The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 2d of this Section V.
- f. The falsification of any of the above certifications may subject the contractor to civil or criminal prosecution under 18 U.S.C. 1001 and 31 U.S.C. 231.
- g. The contractor or subcontractor shall make the records required under paragraph 2b of this Section V available for inspection, copying, or transcription by authorized representatives of the SHA, the FHWA, or the DOL, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the SHA, the FHWA, the DOL, or all may, after written notice to the contractor, sponsor, applicant, or owner, take such actions as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

## **VI. RECORD OF MATERIALS, SUPPLIES, AND LABOR**

- 1. On all Federal-aid contracts on the National Highway System, except those which provide solely for the installation of protective devices at railroad grade crossings, those which are constructed on a force account or direct labor basis, highway beautification contracts, and contracts for which the total final construction cost for roadway and bridge is less than \$1,000,000 (23 CFR 635) the contractor shall:
  - a. Become familiar with the list of specific materials and supplies contained in Form FHWA-47, "Statement of Materials and Labor Used by Contractor of Highway Construction Involving Federal Funds," prior to the commencement of work under this contract.
  - b. Maintain a record of the total cost of all materials and supplies purchased for and incorporated in the work, and also of the quantities of those specific materials and supplies listed on Form FHWA-47, and in the units shown on Form FHWA-47.

- c. Furnish, upon the completion of the contract, to the SHA resident engineer on Form FHWA-47 together with the data required in paragraph 1b relative to materials and supplies, a final labor summary of all contract work indicating the total hours worked and the total amount earned.
2. At the prime contractor's option, either a single report covering all contract work or separate reports for the contractor and for each subcontract shall be submitted.

#### **VII. SUBLETTING OR ASSIGNING THE CONTRACT**

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the State. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635).
  - a. "Its own organization" shall be construed to include only workers employed and paid directly by the prime contractor and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor, assignee, or agent of the prime contractor.
  - b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid on the contract as a whole and in general are to be limited to minor components of the overall contract.
2. The contract amount upon which the requirements set forth in paragraph 1 of Section VII is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.
3. The contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the SHA contracting officer determines is necessary to assure the performance of the contract.
4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the SHA contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the SHA has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

#### **VIII. SAFETY: ACCIDENT PREVENTION**

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the SHA contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.
2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 333).
3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 333).



## **IX. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS**

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, the following notice shall be posted on each Federal-aid highway project (23 CFR 635) in one or more places where it is readily available to all persons concerned with the project:

### **Notice To All Personnel Engaged On Federal-Aid Highway Projects**

18 U.S.C. 1020 READS AS FOLLOWS:

"Whoever being an officer, agent, or employee of the United States, or any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 1, 1916, (39 Stat. 355), as amended and supplemented;

Shall be fined not more than \$10,000 or imprisoned not more than 5 years or both."

## **X. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT**

(Applicable to all Federal-aid construction contracts and to all related subcontracts of \$100,000 or more.)

By submission of this bid or the execution of this contract, or subcontract, as appropriate, the bidder, Federal-aid construction contractor, or subcontractor, as appropriate, will be deemed to have stipulated as follows:

1. That any facility that is or will be utilized in the performance of this contract, unless such contract is exempt under the Clean Air Act, as amended (42 U.S.C. 1857 et seq., as amended by Pub.L. 91-604), and under the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251 et seq., as amended by Pub.L. 92-500), Executive Order 11738, and regulations in implementation thereof (40 CFR 15) is not listed, on the date of contract award, on the U.S. Environmental Protection Agency (EPA) List of Violating Facilities pursuant to 40 CFR 15.20.
2. That the firm agrees to comply and remain in compliance with all the requirements of Section 114 of the Clean Air Act and Section 308 of the Federal Water Pollution Control Act and all regulations and guidelines listed thereunder.
3. That the firm shall promptly notify the SHA of the receipt of any communication from the Director, Office of Federal Activities, EPA, indicating that a facility that is or will be utilized for the contract is under consideration to be listed on the EPA List of Violating Facilities.
4. That the firm agrees to include or cause to be included the requirements of paragraph 1 through 4 of this Section X in every nonexempt subcontract, and further agrees to take such action as the government may direct as a means of enforcing such requirements.

## **XI. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION**

### **1. Instructions for Certification - Primary Covered Transactions:**

(Applicable to all Federal-aid contracts - 49 CFR 29)

- a. By signing and submitting this proposal, the prospective primary participant is providing the certification set out below.
- b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective primary participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction.
- c. The certification in this clause is a material representation of fact upon which reliance was placed when the department or agency determined to enter into this transaction. If it is later determined that the prospective primary participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause of default.
- d. The prospective primary participant shall provide immediate written notice to the department or agency to whom this proposal is submitted if any time the prospective primary participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.
- e. The terms "covered transaction," "debarred," "suspended," "ineligible," "lower tier covered transaction," "participant," "person," "primary covered transaction," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the department or agency to which this proposal is submitted for assistance in obtaining a copy of those regulations.
- f. The prospective primary participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.
- g. The prospective primary participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," provided by the department or agency entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.
- h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the nonprocurement portion of the "Lists of Parties Excluded From Federal Procurement or Nonprocurement Programs" (Nonprocurement List) which is compiled by the General Services Administration.
- i. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.
- j. Except for transactions authorized under paragraph f of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

**Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion — Primary Covered Transactions**

1. The prospective primary participant certifies to the best of its knowledge and belief, that it and its principals:

- a. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
  - b. Have not within a 3-year period preceding this proposal been convicted of or had a civil judgement rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
  - c. Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph 1b of this certification; and
  - d. Have not within a 3-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.
2. Where the prospective primary participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

## **2. Instructions for Certification - Lower Tier Covered Transactions:**

(Applicable to all subcontracts, purchase orders and other lower tier transactions of \$25,000 or more - 49 CFR 29)

- a. By signing and submitting this proposal, the prospective lower tier is providing the certification set out below.
- b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.
- c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances.
- d. The terms "covered transaction," "debarred," "suspended," "ineligible," "primary covered transaction," "participant," "person," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations.
- e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.
- f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.
- g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the Nonprocurement List.
- h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is

not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

- i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

#### **Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion — Lower Tier Covered Transactions**

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.
2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

#### **XII. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING**

(Applicable to all Federal-aid construction contracts and to all related subcontracts which exceed \$100,000 - 49 CFR 20)

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:
  - a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
  - b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.
3. The prospective participant also agrees by submitting his or her bid or proposal that he or she shall require that the language of this certification be included in all lower tier subcontracts, which exceed \$100,000 and that all such recipients shall certify and disclose accordingly.

## FEDERAL-AID FEMALE AND MINORITY GOALS

In accordance with Section II, "Nondiscrimination," of "Required Contract Provisions Federal-aid Construction Contracts" the following are the goals for female utilization:

|   |     |
|---|-----|
| Goal for Women (applies nationwide).....(percent) | 6.9 |
|---|-----|

The following are goals for minority utilization:

### CALIFORNIA ECONOMIC AREA

|            |  | <b>Goal<br/>(Percent)</b> |
|------------|--|---------------------------|
| <b>174</b> | <b>Redding, CA:</b>  |                           |
|            | Non-SMSA Counties  | 6.8                       |
|            | CA Lassen; CA Modoc; CA Plumas; CA Shasta; CA Siskiyou; CA Tehama.                     |                           |
| <b>175</b> | <b>Eureka, CA</b>  |                           |
|            | Non-SMSA Counties  | 6.6                       |
|            | CA Del Norte; CA Humboldt; CA Trinity.   |                           |
| <b>176</b> | <b>San Francisco-Oakland-San Jose, CA:</b>   |                           |
|            | SMSA Counties:   |                           |
|            | 7120 Salinas-Seaside-Monterey, CA  | 28.9                      |
|            | CA Monterey.   |                           |
|            | 7360 San Francisco-Oakland   | 25.6                      |
|            | CA Alameda; CA Contra Costa; CA Marin; CA San Francisco; CA San Mateo.                 |                           |
|            | 7400 San Jose, CA  | 19.6                      |
|            | CA Santa Clara.  |                           |
|            | 7485 Santa Cruz, CA.   | 14.9                      |
|            | CA Santa Cruz.   |                           |
|            | 7500 Santa Rosa, CA  | 9.1                       |
|            | CA Sonoma.   |                           |
|            | 8720 Vallejo-Fairfield- Napa, CA   | 17.1                      |
|            | CA Napa; CA Solano   |                           |
|            | Non-SMSA Counties  | 23.2                      |
|            | CA Lake; CA Mendocino; CA San Benito   |                           |
| <b>177</b> | <b>Sacramento, CA:</b>   |                           |
|            | SMSA Counties:   |                           |
|            | 6920 Sacramento, CA  | 16.1                      |
|            | CA Placer; CA Sacramento; CA Yolo.   |                           |
|            | Non-SMSA Counties  | 14.3                      |
|            | CA Butte; CA Colusa; CA El Dorado; CA Glenn; CA Nevada; CA Sierra; CA Sutter; CA Yuba. |                           |
| <b>178</b> | <b>Stockton-Modesto, CA:</b>   |                           |
|            | SMSA Counties:   |                           |
|            | 5170 Modesto, CA   | 12.3                      |
|            | CA Stanislaus.   |                           |
|            | 8120 Stockton, CA  | 24.3                      |
|            | CA San Joaquin.  |                           |
|            | Non-SMSA Counties  | 19.8                      |
|            | CA Alpine; CA Amador; CA Calaveras; CA Mariposa; CA Merced; CA Tuolumne.               |                           |

|            |  | <b>Goal<br/>(Percent)</b> |
|------------|--|---------------------------|
| <b>179</b> | <b>Fresno-Bakersfield, CA</b>              |                           |
|            | SMSA Counties:                             |                           |
|            | 0680 Bakersfield, CA                       | 19.1                      |
|            | CA Kern.                                   |                           |
|            | 2840 Fresno, CA                            | 26.1                      |
|            | CA Fresno.                                 |                           |
|            | Non-SMSA Counties                          | 23.6                      |
|            | CA Kings; CA Madera; CA Tulare.            |                           |
| <b>180</b> | <b>Los Angeles, CA:</b>                    |                           |
|            | SMSA Counties:                             |                           |
|            | 0360 Anaheim-Santa Ana-Garden Grove, CA    | 11.9                      |
|            | CA Orange.                                 |                           |
|            | 4480 Los Angeles-Long Beach, CA            | 28.3                      |
|            | CA Los Angeles.                            |                           |
|            | 6000 Oxnard-Simi Valley-Ventura, CA        | 21.5                      |
|            | CA Ventura.                                |                           |
|            | 6780 Riverside-San Bernardino-Ontario, CA. | 19.0                      |
|            | CA Riverside; CA San Bernardino.           |                           |
|            | 7480 Santa Barbara-Santa Maria-Lompoc, CA  | 19.7                      |
|            | CA Santa Barbara.                          |                           |
|            | Non-SMSA Counties                          | 24.6                      |
|            | CA Inyo; CA Mono; CA San Luis Obispo.      |                           |
| <b>181</b> | <b>San Diego, CA:</b>                      |                           |
|            | SMSA Counties                              |                           |
|            | 7320 San Diego, CA.                        | 16.9                      |
|            | CA San Diego.                              |                           |
|            | Non-SMSA Counties                          | 18.2                      |
|            | CA Imperial.                               |                           |

In addition to the reporting requirements set forth elsewhere in this contract the Contractor and subcontractors holding subcontracts, not including material suppliers, of \$10,000 or more, shall submit for every month of July during which work is performed, employment data as contained under Form FHWA PR-1391 (Appendix C to 23 CFR, Part 230), and in accordance with the instructions included thereon.

## **FEDERAL REQUIREMENT TRAINING SPECIAL PROVISIONS**

As part of the Contractor's equal employment opportunity affirmative action program, training shall be provided as follows:

The Contractor shall provide on-the-job training to develop full journeymen in the types of trades or job classification involved.

The goal for the number of trainees or apprentices to be trained under the requirements of this special provision will be 9.

In the event the Contractor subcontracts a portion of the contract work, he shall determine how many, if any, of the trainees or apprentices are to be trained by the subcontractor, provided however, that the Contractor shall retain the primary responsibility for meeting the training requirements imposed by this special provision. The Contractor shall also insure that this Training Special Provision is made applicable to such subcontract. Where feasible, 25 percent of trainees or apprentices in each occupation shall be in their first year of apprenticeship or training.

The number of trainees or apprentices shall be distributed among the work classifications on the basis of the Contractor's needs and the availability of journeymen in the various classifications within a reasonable area of recruitment. Prior to commencing work, the Contractor shall submit to the Department for approval the number of trainees or apprentices to be trained in each selected classification and training program to be used. Furthermore, the Contractor shall specify the starting time for training in each of the classifications. The Contractor will be credited for each trainee or apprentice employed by him on the contract work who is currently enrolled or becomes enrolled in an approved program and will be reimbursed for such trainees or apprentices as provided hereinafter.

Training and upgrading of minorities and women toward journeymen status is a primary objective of this Training Special Provision. Accordingly, the Contractor shall make every effort to enroll minority and women trainees or apprentices (e.g., by conducting systematic and direct recruitment through public and private sources likely to yield minority and women trainees or apprentices) to the extent such persons are available within a reasonable area of recruitment. The Contractor will be responsible for demonstrating the steps that he has taken in pursuance thereof, prior to a determination as to whether the Contractor is in compliance with this Training Special Provision. This training commitment is not intended, and shall not be used, to discriminate against any applicant for training, whether a member of a minority group or not.

No employee shall be employed as a trainee or apprentice in any classification in which he has successfully completed a training course leading to journeyman status or in which he has been employed as a journeyman. The Contractor should satisfy this requirement by including appropriate questions in the employee application or by other suitable means. Regardless of the method used the Contractor's records should document the findings in each case.

The minimum length and type of training for each classification will be as established in the training program selected by the Contractor and approved by both the Department and the Federal Highway Administration. The Department and the Federal Highway Administration will approve a program if it is reasonably calculated to meet the equal employment opportunity obligations of the Contractor and to qualify the average trainee or apprentice for journeyman status in the classification concerned by the end of the training period. Furthermore, apprenticeship programs registered with the U.S. Department of Labor, Bureau of Apprenticeship and Training, or with the State of California, Department of Industrial Relations, Division of Apprenticeship Standards recognized by the Bureau and training programs approved but not necessarily sponsored by the U.S. Department of Labor, Manpower Administration, Bureau of Apprenticeship and Training shall also be considered acceptable provided it is being administered in a manner consistent with the equal employment obligations of Federal-aid highway construction contracts. Approval or acceptance of a training program shall be obtained from the State prior to commencing work on the classification covered by the program. It is the intention of these provisions that training is to be provided in the construction crafts rather than clerk-typists or secretarial-type positions. Training is permissible in lower level management positions such as office engineers, estimators, timekeepers, etc., where the training is oriented toward construction applications. Training in the laborer classification may be permitted provided that significant and meaningful training is provided and approved by the division office. Some offsite training is permissible as long as the training is an integral part of an approved training program and does not comprise a significant part of the overall training.

Except as otherwise noted below, the Contractor will be reimbursed 80 cents per hour of training given an employee on this contract in accordance with an approved training program. As approved by the Engineer, reimbursement will be made for training of persons in excess of the number specified herein. This reimbursement will be made even though the Contractor receives additional training program funds from other sources, provided such other source does not specifically prohibit the Contractor from receiving other reimbursement. Reimbursement for offsite training indicated above may only be made to the Contractor where he does one or more of the following and the trainees or apprentices are concurrently employed on a Federal-aid project; contributes to the cost of the training, provides the instruction to the trainee or apprentice or pays the trainee's or apprentice's wages during the offsite training period.

No payment shall be made to the Contractor if either the failure to provide the required training, or the failure to hire the trainee or apprentice as a journeyman, is caused by the Contractor and evidences a lack of good faith on the part of the Contractor in meeting the requirements of this Training Special Provision. It is normally expected that a trainee or apprentice will begin his training on the project as soon as feasible after start of work utilizing the skill involved and remain on the

project as long as training opportunities exist in his work classification or until he has completed his training program. It is not required that all trainees or apprentices be on board for the entire length of the contract. A Contractor will have fulfilled his responsibilities under this Training Special Provision if he has provided acceptable training to the number of trainees or apprentices specified. The number trained shall be determined on the basis of the total number enrolled on the contract for a significant period.

Only trainees or apprentices registered in a program approved by the State of California's State Administrator of Apprenticeship may be employed on the project and said trainees or apprentices shall be paid the standard wage specified under the regulations of the craft or trade at which they are employed.

The Contractor shall furnish the trainee or apprentice a copy of the program he will follow in providing the training. The Contractor shall provide each trainee or apprentice with a certification showing the type and length of training satisfactorily completed.

The Contractor will provide for the maintenance of records and furnish periodic reports documenting his performance under this Training Special Provision.